TM 10-4930-370-10

TECHNICAL MANUAL

OPERATOR MANUAL
FOR

MODULAR FUEL SYSTEM TANK RACK MODULE WITH STAND-ALONE RETAIL CAPABILITY

M107
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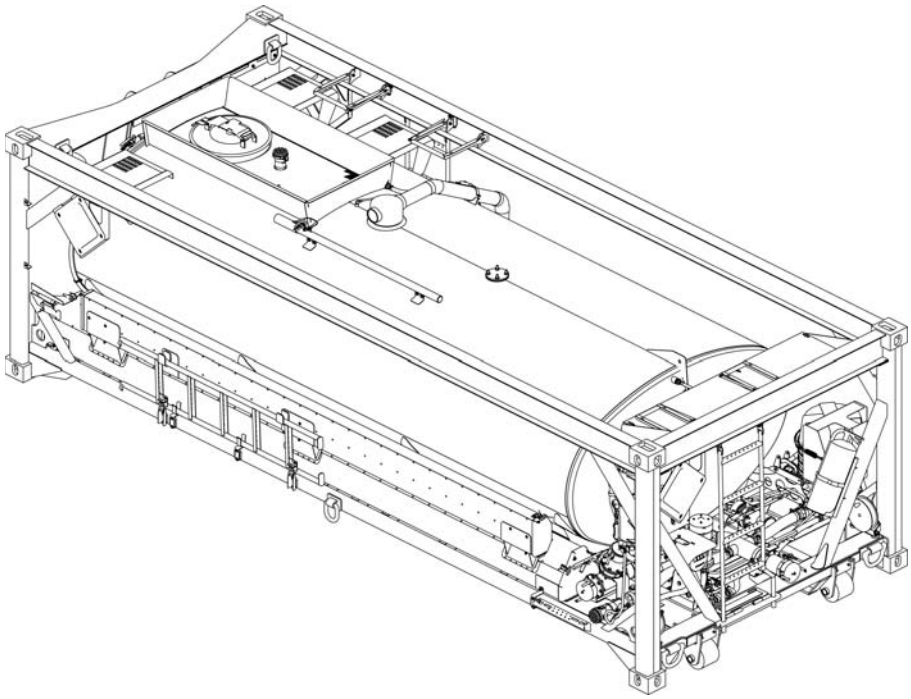

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HEADQUARTERS, DEPARTMENT OF THE ARMY
16 September 2015

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in injury or death to personnel. Also included are explanations of safety and hazardous materials icons used with this technical manual.

FOR INFORMATION ON FIRST AID, REFER TO FM 4-25.11.

EXPLANATION OF SAFETY WARNING ICONS

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

EYE PROTECTION - person with goggles shows that the material will injure the eyes.

FIRE - flame shows that a material may ignite and cause burns.

FLYING PARTICLES - arrows bouncing off face with face shield show that particles flying through the air will harm face.

HEAD PROTECTION - arrow bouncing off head with helmet shows that low clearance presents a danger.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting techniques.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

PINCH POINT - hand with fingers caught between rollers shows that the parts of the equipment present a danger to life or limb.

SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger from falling.

GENERAL SAFETY WARNING DESCRIPTION

WARNING

LIFTING ARM

Know the load limits of your lift before attempting to lift the TRM. Keep personnel at least 6 ft (2 m) away from the TRM being raised. Failure to comply could result in injury or death to personnel.

WARNING

LOW CLEARANCE

Upper support beam on rear of TRM is 63 in. (1.6 m) above the ground. Use caution when operating valves and equipment at rear of TRM to avoid striking head on support beam. Failure to comply could result in injury to personnel.

WARNING

MANHOLE COVER

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

WARNING

SLIPPERY SURFACE

Wet metal surfaces are slippery. Use caution when climbing on tank. Failure to comply could result in injury or death to personnel.

WARNING

UNUSUAL ENVIRONMENT/WEATHER

- When operating the TRM in temperatures of 100ºF (38ºC) or higher, take extra care to minimize the possibility of an explosion and fire.
- Fuels evaporate very quickly. Fuel contact of skin can quickly lower the temperature of exposed skin making the area susceptible to frostbite. Prevent leakage of fuel onto bare skin.
- When operating the TRM in temperatures down to -25ºF (-31ºC), take extra care to minimize the possibility of frostbite to personnel.
- Failure to comply could result in injury or death to personnel.

EXPLANATION OF HAZARDOUS MATERIALS ICONS

BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.

CHEMICAL - drop of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.

HIGH-PRESSURE FLUID - high-pressure fluid spraying human hand shows that fluid escaping under great pressure can cause injury or death.

RADIOACTIVE - identifies a material that emits radioactive energy and can injure human tissue or organs.

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

HAZARDOUS MATERIALS DESCRIPTION

WARNING

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR

In the event equipment has been exposed to chemical, biological, radiological, and nuclear decontamination warfare, the equipment shall be handled with extreme caution and decontaminated in accordance with FM 3-11.5, NBC Decontamination. Unprotected personnel can experience injury or death if residual toxic agents or radioactive materials are present. If equipment is exposed to radioactive, biological, or chemical agents, personnel must wear protective mask, hood, protective overgarments, chemical gloves, and chemical boots in accordance with Mission Oriented Protective Posture (MOPP) level prescribed by the Officer In Charge (OIC) or Non-Commissioned Officer In Charge (NCOIC). MOPP analysis and levels are described in detail in FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for NBC Protection. Personnel should contact a unit that has capability for freshwater washdown. The unit can also assist in the evacuation of soldiers who have been exposed and provide space and shelter for exchanging MOPP suits. Failure to comply could result in injury or death to personnel.

WARNING

CORROSION PREVENTIVE COMPOUND

Corrosion preventive compound is toxic and an irritant to eyes, skin, and respiratory system. Goggles and gloves must be worn when working with corrosion preventive compound. Avoid contact with eyes and skin. Avoid breathing vapors and ensure there is adequate ventilation. If sealing compound contacts eyes, flush eyes with cold water for at least 15 minutes and seek immediate medical attention. If sealing compound contacts skin, wash skin thoroughly with soap and water. Failure to comply could result in injury or death to personnel.

HAZARDOUS MATERIALS DESCRIPTION - CONTINUED

WARNING

FUEL

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Discharge static electricity before fueling operations by touching a metal surface away from fuel nozzle. Static electricity may cause fuel to ignite.
- Cellular phones or other electronic devices must not be used within 25 ft (7.6 m) of TRM. Use of cellular phones and other electronic devices during fueling may cause fuel to ignite.
- Do not wear wool, nylon, silk, rayon, or other items having a tendency to generate static electricity. Static electricity may cause fuel to ignite.
- Wear clean cotton clothing with no metal buttons, zippers or fasteners. Remove all contents from pockets. Static electricity from metal objects may cause fuel to ignite.
- Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite.
- Failure to comply could result in injury or death to personnel.

WARNING

SLAVE ASSISTING CABLE

- Connect only using an approved North Atlantic Treaty Organization (NATO) cable that does not have loose or missing insulation. Electric shock could occur, leading to injury or death.
- Do not proceed if suitable cable is not available.
- Failure to comply could result in injury or death to personnel.

HAZARDOUS MATERIALS DESCRIPTION - CONTINUED

WARNING

SOLVENT-DETERGENT CLEANING COMPOUND

Solvent-detergent compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury or death to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the “Change No.” column indicates an original page or work package.

Date of issue for the original manual is:

Original.... 16 September 2015

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 38 AND TOTAL NUMBER OF WORK PACKAGES IS 67, CONSISTING OF THE FOLLOWING:

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i-ix/blank.	0	WP 0031 (16 pgs)	0
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WP 0064 (8 pgs)	0	Back Cover	0
Chapter 5 title page (2 pgs)	0		

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Washington, D.C., 16 September 2015

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet on the TACOM Unique Logistics Support Applications (TULSA) Web site. The Internet address is https://tulsa.tacom.army.mil. Access to all applications requires CAC authentication, and you must complete the Access Request form the first time you use it. The DA Form 2028 is located under the TULSA Applications on the left-hand navigation bar. Fill out the form and click on SUBMIT. Using this form on the TULSA Web site will enable us to respond more quickly to your comments and to better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-IMP TECH PUBS, MS 727, 6501 E. 11 Mile Road, Warren, MI 48397-5000. The e-mail address is usarmy.detroit.tacom.mbx.ilsc-tech-pubs@mail.mil. The fax number is DSN 786-1856 or Commercial (586) 282-1856. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

This manual contains certain features to improve the convenience of using this manual and increase the user's efficiency. These features include:

a. **Accessing Information.** This manual contains a Front Cover, Warning Summary, List of Effective Pages, Title Block Page, Table of Contents, Chapters 1 through 5, and an Alphabetical Index. Information is accessed by referring to Table of Contents, located in the front of this manual, or by looking in the Alphabetical Index, located in the back of the manual.

b. **Illustrations.** Various methods are used to locate, operate and repair or replace components. Locator illustrations in Controls and Indicator tables, PMCS tables, exploded views and cutaway diagrams make the information in the manual easier to understand and follow.

c. **Using This Manual.** When using this manual, read and understand the entire operator or maintenance action before performing the task. Also, read and understand all warnings, cautions and notes, as well as general safety precautions that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be operated, maintained or repaired. However, the summary is not all-inclusive and personnel should be aware at all times of hazardous conditions that may arise.

Prior to starting the procedures in this manual, read the initial setup requirements located directly above each procedure. The information is given to ensure all materials, expendables, tools and any other equipment necessary are readily available for use. The initial setup will be accomplished prior to starting the actual steps of each operator or maintenance procedure.

LOCATING MAJOR COMPONENTS

Obtain the manual for the system to be worked on. Open to the Table of Contents located in the front of this manual. Find Chapter 1, Equipment Description and Theory of Operation. Under the chapter title you will find the work package titled Equipment Description and Data which contains Location and Description of Major Components. Turn to the work package indicated. This work package will give a brief description of the major components, and show an illustration of what the component looks like and its location.

Equipment Description and Data, which contains Location and Description of Major Components, can also be found under letter E in the Alphabetical Index. The work package is found on the right side of the title where the Equipment Description and Data is located. Turn to the work package indicated to find the description and location of each component.

OPERATING PROCEDURES

The Table of Contents or Alphabetical Index may be used to locate sections within this manual. To locate a particular operating procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 2, Operator Instructions. Under this section, find the title for the component you are trying to operate. At the end of the title you will find, in parenthesis, which model of module the task pertains to. To the right side of the procedure will be a work package number. Turn to the work package indicated and follow the steps to perform the procedure. The procedures list how to set up the equipment, how to program the equipment and how to operate the equipment. Follow the procedures indicated to complete the task.

At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

a. **Tools and Special Tools.** Lists all tools from the Basic Issue Items (BII) required to perform the task. Tools are identified with an item number and table number from the BII (WP 0066).

b. **Materials/Parts.** Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 5, Supporting Information.

c. **Personnel Required.** Lists all personnel necessary to perform the task. Procedures in this manual are intended to be performed by Military Occupation Specialty (MOS) 92F, Petroleum Supply Specialist.

OPERATING PROCEDURES - CONTINUED

d. **References.** Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within the task. A listing of reference materials is contained in the work package References in Chapter 5, Supporting Information.

e. **Equipment Condition.** Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite operator tasks to be performed with reference to the work package number or to the Technical Manual (TM) number.

TROUBLESHOOTING PROCEDURES

The Table of Contents or Alphabetical Index may be used to locate sections within this manual. To locate a particular troubleshooting procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 3, Operator Troubleshooting Procedures. Under this section, find a work package titled Operator Troubleshooting Index. Turn to the work package indicated, which lists all of the troubleshooting procedures. Look down the list until you find the appropriate work package for the problem you are trying to solve. To the right side of the procedure will be a work package number. Turn to the work package indicated and follow the steps to complete the troubleshooting procedure. The procedures list the malfunction, symptom and the corrective action. The corrective action will indicate which maintenance procedure to go to for the repair of the symptom or what level of maintenance is capable of repair of the problem. Follow the procedures indicated to complete the task. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

a. **Tools and Special Tools.** Lists all tools from the Basic Issue Items (BII) required to perform the task. Tools are identified with an item number and table number from the BII (WP 0066).

b. **Materials/Parts.** Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 5, Supporting Information.

c. **Personnel Required.** Lists all personnel necessary to perform the task. Procedures in this manual are intended to be performed by Military Occupation Specialty (MOS) 92F, Petroleum Supply Specialist.

d. **References.** Includes any other manuals or work packages necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within the task. A listing of manuals referenced is contained in the work package References in Chapter 5, Supporting Information.

e. **Equipment Condition.** Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or the TM number.

MAINTENANCE INSTRUCTIONS

To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Locate Chapter 4, Operator Maintenance Instructions. Look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

a. **Tools and Special Tools.** Lists all tools from the Basic Issue Items (BII) required to perform the task. Tools are identified with an item number and table number from the BII (WP 0066).

b. **Materials/Parts.** Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 5, Supporting Information.

c. **Personnel Required.** Lists all personnel necessary to perform the task. Procedures in this manual are intended to be performed by Military Occupation Specialty (MOS) 92F, Petroleum Supply Specialist.

d. **References.** Include any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package titled References in Chapter 5, Supporting Information.

MAINTENANCE INSTRUCTIONS - CONTINUED

e. **Equipment Condition.** Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or the TM number.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

OPERATOR MAINTENANCE

MODULAR FUEL SYSTEM TANK RACK MODULE GENERAL INFORMATION

SCOPE

This manual contains descriptions and instructions for the Modular Fuel System (MFS) Tank Rack Module, referred to as Tank Rack Module (TRM).

Type of Manual: Operator Maintenance.

Model Number and Equipment Name: M107, MFS TRM with Stand-Alone Retail Capability (S-ARC).

Purpose of Equipment: The TRM is designed to be used by forward-area petroleum personnel to receive, store, and dispense fuel.

Procedures in this manual are intended to be performed by Military Occupation Specialty (MOS) 92F, Petroleum Supply Specialist.

MAINTENANCE FORMS, RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your TRM needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance.

All non-Aviation/Missile EIRs and Product Quality Deficiency Reports (PQDRs) must be submitted through the Product Data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: https://www.pdrep.csd.disa.mil/.

If you do not have Internet access, you may submit your PQDR information using Standard Form (SF) 368. You can send your SF 368 using e-mail, regular mail, or fax using the addresses/fax numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

HAND RECEIPT (HR) MANUALS

There is no HR manual for the TRM.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. The term “corrosion” means the deterioration of a material or its properties due to a reaction of that material with its chemical environment. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastics, composites, and rubbers can also degrade (also considered to be corrosion based on the above definition of corrosion). Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically ultraviolet) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. The US Army has defined the following nine (9) forms of corrosion used to evaluate the deterioration of metals. These shall be used when evaluating and documenting corrosion.

UNIFORM (or general attack): Affects a large area of exposed metal surface, like rust on steel or tarnish on silver. It gradually reduces the thickness of the metal until it fails.

CREVICE: Occurs in crevices created by rubber seals, gaskets, bolt heads, lap joints, dirt or other surface deposits. It will develop anywhere moisture or other corrosive agents are trapped and unable to drain or evaporate.

CORROSION PREVENTION AND CONTROL (CPC) - CONTINUED

SELECTIVE LEACHING: One element, usually the anodic element of an alloy, corrodes away, leaving the cathodic element. This can create holes in metal.

INTERGRANULAR: Metal deterioration caused by corrosion on the bonds between or across the grain boundaries of the metal. The metal will appear to be peeling off in sheets, flaking, or being pushed apart by layers. A particular type of intergranular corrosion is exfoliation.

PITTING: This can result from conditions similar to those for crevice corrosion. Pits can develop on various materials due to their composition. Rifle boxes are big victims of pitting.

EROSION: Results when a moving fluid (liquid or gas) flows across a metal surface, particularly when solid particles are present in the fluid. Corrosion actually occurs on the surface of the metal, but the moving fluid washes away the corrosion and exposes a new metal surface, which also corrodes.

FRETTING: Occurs as a result of small, repetitive movements (e.g., vibration) between two surfaces in contact with each other. It is usually identified by a black powder corrosion product or pits on the surface.

GALVANIC: Occurs when two different types of metal come in contact with each other, like steel bolts on aluminum, for example. This is a common problem on aircraft because of their mix of metals.

STRESS: Term used to describe corrosion cracking and corrosion fatigue.

Where an item is not ready/available due to one of these forms of corrosion, it shall be recorded as a corrosion failure in the inspection record and the appropriate code (170) for corrosion shall be used when requesting/performing maintenance.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The procedures for destruction of Army materiel to prevent enemy use are contained in TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

Requirements for packaging and administrative storage of the TRM are contained in Preparation for Storage or Shipment (WP 0064) and in the TRM Shipping and Storage Instructions (SSI).

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
AR	Army Regulation
ATLAS	All Terrain Lifter Army System
ATP	Army Techniques Publication
ATTP	Army Tactics, Techniques, and Procedures
BCT	Brigade Combat Team
BII	Basic Issue Items
BX	Box
C	Celsius
CAGEC	Commercial and Government Entity Code
CBRN	Chemical, Biological, Radiological, and Nuclear
cm	Centimeter
CN	Can
COEI	Components of End Item
CPC	Corrosion Prevention and Control

LIST OF ABBREVIATIONS/ACRONYMS – CONTINUED

Abbreviation/Acronym	Name
CTA	Common Table of Allowances
DA	Department of the Army
EA	Each
EDIL	Expendable Durable Items List
EIR	Equipment Improvement Recommendations
EMI	Electromagnetic Interference
F	Fahrenheit
FM	Field Manual
ft	Foot
gal.	Gallon
GPM	Gallon Per Minute
HEMTT	Heavy Expanded Mobility Tactical Truck
HEMTT-LHS	Heavy Expanded Mobility Tactical Truck-Load Handling System
HI	High
HP	Horsepower
HR	Hand Receipt
in.	Inch
ISO	International Standards Organization
IUID	Item Unique Identification
kg	Kilogram
L	Liter
lb	Pound
LHS	Load Handling System
LPM	Liter Per Minute
LVAD	Low Velocity Air Drop
m	Meter
MFS	Modular Fuel System
MOPP	Mission Oriented Protective Posture
MOS	Military Occupation Specialty
MTOE	Modified Table of Organization and Equipment
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NCOIC	Noncommissioned Officer In Charge
NSN	National Stock Number
OEM	Original Equipment Manufacturer
OIC	Officer in Charge
PAM	Pamphlet
PDREP	Product Data Reporting and Evaluation Program
PG	Package

LIST OF ABBREVIATIONS/ACRONYMS – CONTINUED

Abbreviation/Acronym	Name
PLS	Palletized Load System
PLST	Palletized Load System Trailer
PMCS	Preventive Maintenance Checks and Services
PQDR	Product Quality Deficiency Report
PR	Pair
Qt	Quart
Qty	Quantity
RO	Roll
ROM	Refuel on the Move
RPSTL	Repair Parts and Special Tools List
RQR	Required
S-ARC	Stand Alone Retail Capability
SF	Standard Form
SOP	Standard Operating Procedures
SPCC	Spill Prevention, Control, and Countermeasures
Sq-ft	Square Foot
Sq-m	Square Meter
SSI	Shipping and Storage Instructions
TACOM	Tank Automotive Command
TAMMS	The Army Maintenance Management System
TC	Throttle Control
TM	Technical Manual
TOE	Table of Organization and Equipment
TRM	Tank Rack Module
TU	Tube
TULSA	TACOM Unique Logistics Support Applications
U/I	Unit of Issue
VDC	Volts Direct Current
WP	Work Package

SAFETY, CARE, AND HANDLING

The TRM may be used to store various fuels. It must be assumed that residual fuel and fuel vapors are present in the TRM at all times, even after draining or purging. Therefore, equipment must always be handled with the same degree of caution as if it contained fuel. One or more fully charged fire extinguishers must be present at all times.

A static electric charge is always present in all fuels. Any physical movement of fuel will increase static charge, for example when fuel is being pumped, stirred, shaken or splashed. If charge is allowed to build sufficiently, it will discharge, causing a spark that may ignite fuel vapors. Buildup of a static electric charge is controlled by bonding and grounding of the TRM. A ground rod and grounding cable are provided with the TRM and must be inspected, maintained, and used consistently and conscientiously to prevent fuel ignition due to electrostatic discharge. The system should always be grounded except when being transported.

Fuels may contain toxic additives. Personal protective equipment should always be worn when working with the TRM.

Fuels are dangerous under all conditions. Always observe fuel-handling safety precautions and follow fuel-handling procedures per FM 10-67-1 and ATP 4-43.

ITEM UNIQUE IDENTIFICATION

There is an Item Unique Identification (IUID) marking on the data plate on the right rear side of the TRM. The marking must be scanned during performance of procedures to remove and replace the items marked, or when turning in items, or receiving them from supply or another unit. Refer to WP 0031, Figure 3, Data Plates, Right Side (Sheet 1 of 2), for the location of the data plate. The IUID marking is shown as a blank square box.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The TRM is used to receive, store, and issue fuel in selected units at division level and below. The initial use of the TRM is to provide mobile fuel storage and issuing capability for the Brigade Combat Team (BCT). The TRM fielded to the BCT can be transported using a variety of configurations of Palletized Load System (PLS) trailers and trucks. Figure 1 illustrates some possible configurations. The TRM can be used to support relocation of forces by providing refuel-on-the-move (ROM) capability. The units requiring the TRM must possess the ability to rapidly change operational locations and provide petroleum products with minimum use of support assets. Each TRM can transport approximately 2,500 gal. (9,464 L) of fuel over all types of terrain. The flexibility of the system allows the fuel capacity to be tailored to the tactical mission requirement.

The PLS and the Heavy Expanded Mobility Tactical Truck (HEMTT) with the Load Handling System (LHS) are each capable of loading the TRM onto themselves or onto a PLS trailer. This self-load/-unload capability eliminates many of the logistical and planning problems associated with current fuel doctrine, such as having to wait while collapsible tanks or bulk tankers are filled.

The TRM provides the ability to rapidly establish fuel storage capability at any location without the use of material handling or construction equipment. A HEMTT-LHS or PLS can recover the TRM, transport it to a new location, and position the system upon arrival. An empty, full, or partially loaded TRM can be readied for transport, uploaded, and moved in a fraction of the time required for a collapsible tank. Operations can continue uninterrupted by replacing empty TRMs with full ones.

The TRM can also be used for line haul of bulk fuel throughout the theater. A PLS or HEMTT-LHS can transport two TRMs – one on the truck and one on the PLS trailer – for a total of up to 5,000 gal. (18,928 L) of bulk petroleum. The increased mobility and capability of the HEMTT-LHS and PLS allow direct delivery of bulk fuel to a brigade area. The truck unloads the full TRM in the required position and loads any empty TRM for transport back to the fuel resupply point. Although it cannot lift the TRM onto or off a PLS trailer, a HEMTT fueler can tow a PLS trailer with the TRM to transport a total of 5,000 gal. (18,928 L).

The use of the HEMTT-LHS as the prime transporter results in increased cross-country mobility. This expanded capability is critical to uninterrupted resupply of fuel to maneuvering forces.

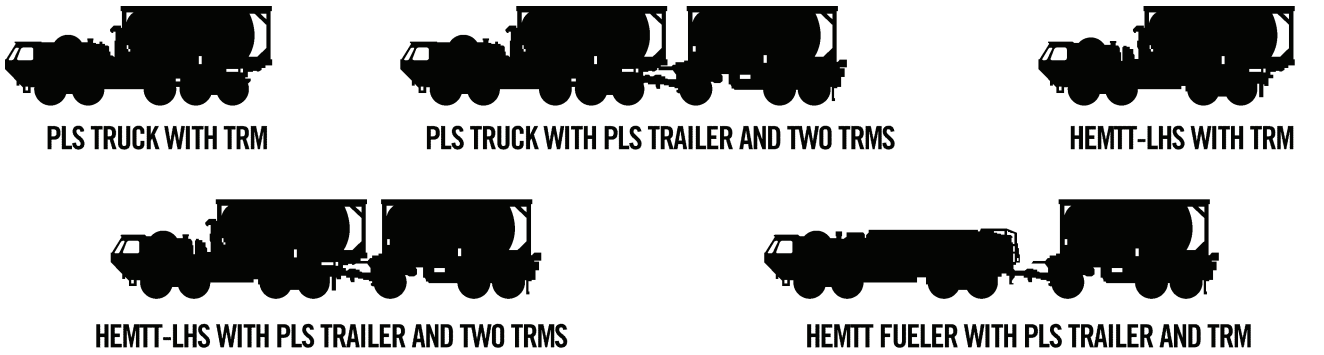


Figure 1. TRM Transport Configurations.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

The TRM consists of the following major components:

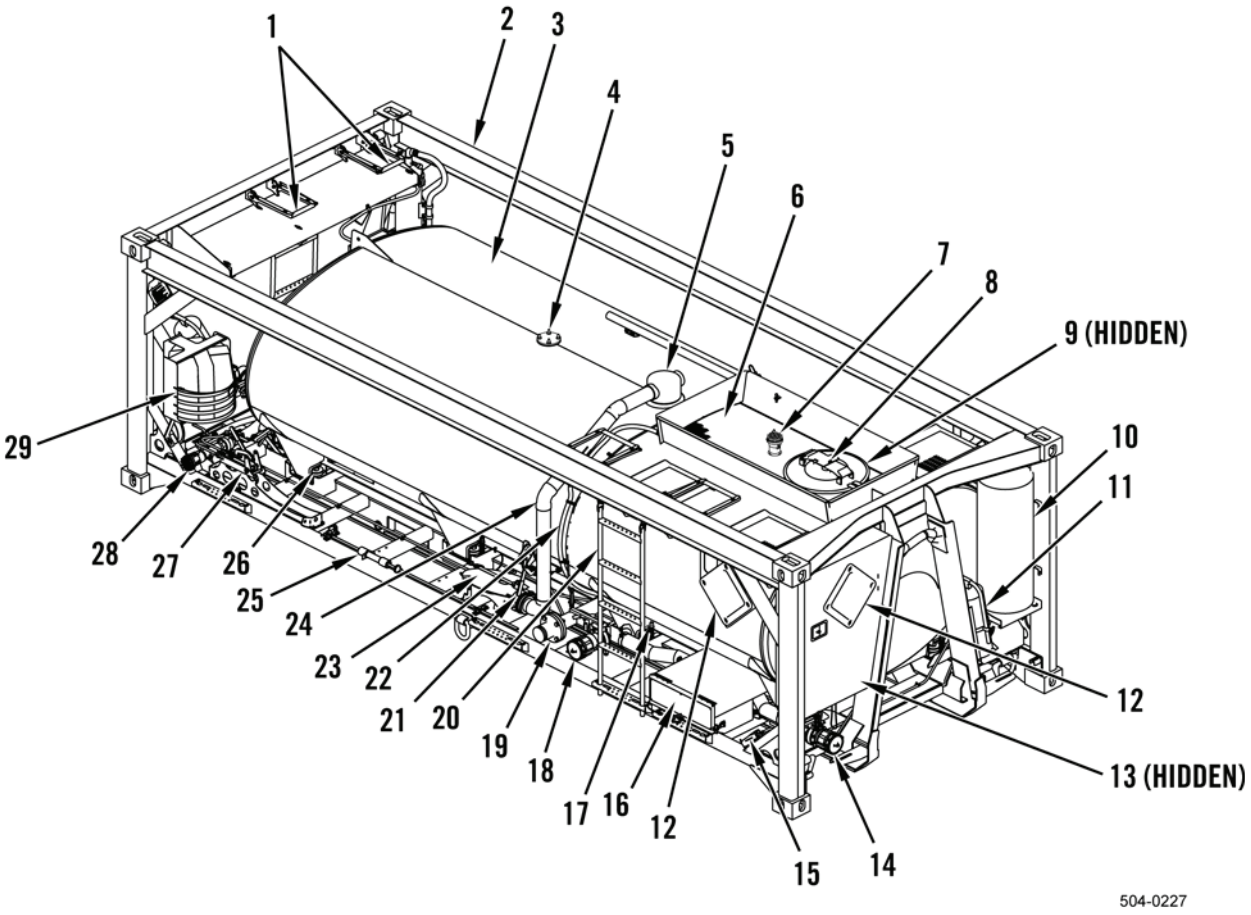


Figure 2. Tank Rack Module - Right Front View.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

Table 1. Tank Rack Module Major Components (Right Front View).

ITEM	DESCRIPTION	QTY
1	ISO Rack Handles	2
2	ISO Rack	1
3	Tank Assembly	1
4	Fuel Tank Cover	1
5	Vent Hood	1
6	Spillbox	1
7	Non-Valved, Unisex Coupling (Top Fill Port F)	1
8	Manhole Cover	1
9	Liquid Level Switch (Inside Manhole)	1
10	Spill Kit	1
11	Fire Extinguisher	1
12	Placard Holder	2
13	Tool Box (Behind Door)	1
14	Discharge Piping (Port G)	1
15	Right Hand Emergency Shutoff Lever	1
16	Cable Tray	1
17	Compression Springs	12
18	Bottom Load Valve Piping Assembly (Port B)	1
19	Internal Valve (Port A) Single Point	1
20	ISO Rack Ladder	1
21	Side Mechanical Operator (V2)	1
22	Spillbox Drain Line	2
23	Transporter Cover	1
24	Vapor Recovery Piping Assembly	1
25	Ground Rod	1
26	Isolation Mounts	16
27	Control Lever Assembly (V1)	1
28	Right Hand Discharge Arm (Port E)	1
29	Drip Pans	4

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

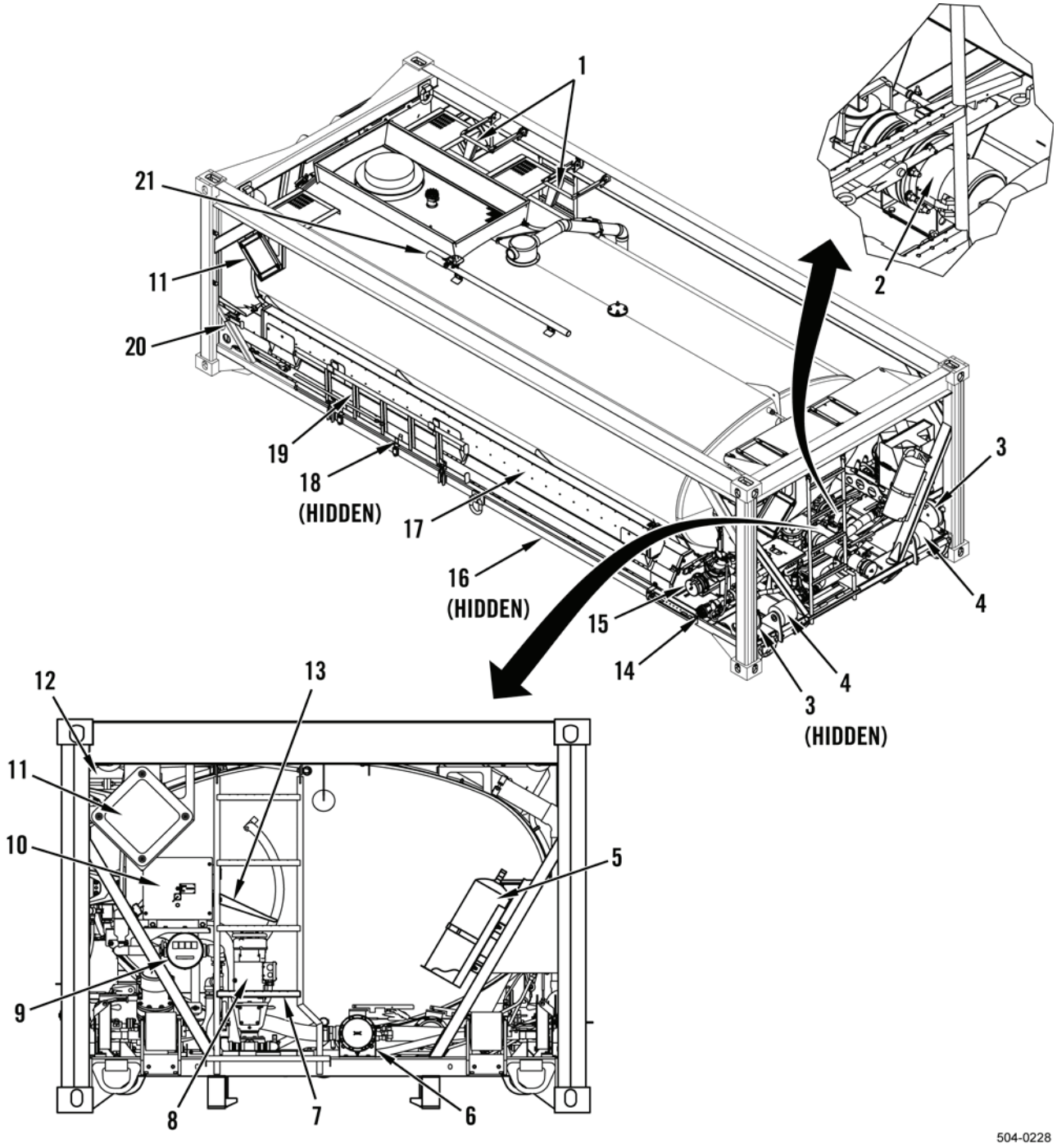


Figure 3. Tank Rack Module - Left Rear View.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

Table 2. Tank Rack Module Major Components (Left Rear View).

ITEM	DESCRIPTION	QTY
1	ISO Rack Handles	2
2	Camlock Adapter and Bracket	1
3	Static Ground Reels	2
4	Rollers	2
5	Fire Extinguisher	1
6	Discharge Piping Assembly (Port C)	1
7	Ladder Assembly	1
8	Fuel Pump Assembly	1
9	Flow Meter	1
10	EMI Control Box	1
11	Placard Holders	2
12	Filter/Separator	1
13	Rear Head Tank Gauge (On Tank)	1
14	Left Hand Discharge Arm (Port D)	1
15	Tee Assembly and Bracket	1
16	V1 Valve (Bottom of Tank)	1
17	Hose Trough Assemblies with Suction Hoses	2
18	V2 Valve (Bottom of Tank)	1
19	Ladder	1
20	Left Hand Emergency Shutoff Lever	1
21	Stowage Tube Assembly (Stows Gauge Stick)	1

EQUIPMENT DATA

Table 3 provides data pertaining to the operation and mechanical characteristics of components within the TRM.

Table 3. Tank Rack Module Specifications.

ITEM CHARACTERISTIC/ SPECIFICATION	DESCRIPTION
Capacity	2,500 gal. (9,464 L)
Weight	18,000 lb (8,164 kg) (Max Payload)
Empty	8,000 lb (3,629 kg)
With 2,500 gal. of fuel	26,000 lb (11,793 kg)
Height	6 ft (1.83 m)
Length	19 ft 11 in. (6.07 m)
Width	8 ft (2.44 m)

TANK ASSEMBLY FILL CAPACITY

1. When the TRM is on level ground, with a fuel level 8 in. (20.3 cm) from lip of the manhole, the rear head indicator dial should read 2,500 gal. (9,464 L), which is nominal “full” capacity of TRM.
2. 2,500 nominal gal. (9,464 L) leaves 5 percent outage or 5 in. (12.7 cm) of air space, measured vertically from the top of the liquid to the inside of the top of the shell (Figure 4).

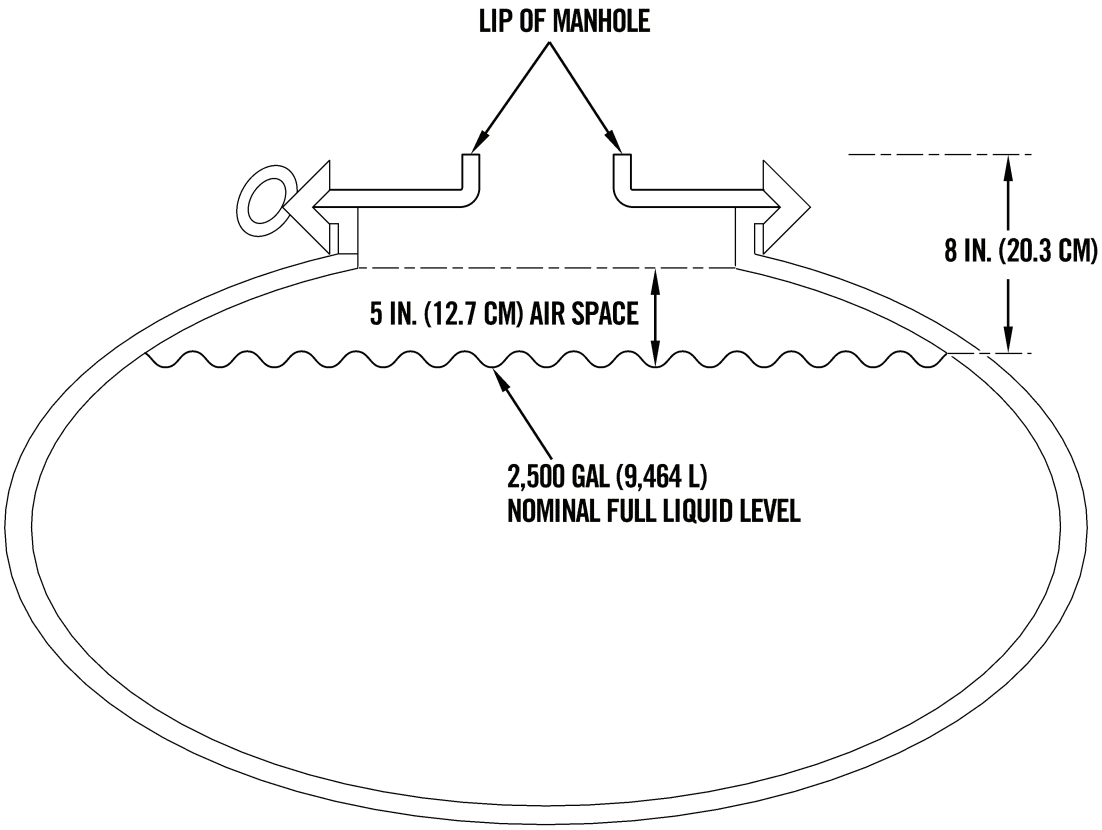


Figure 4. Tank Assembly Fill.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

THEORY OF OPERATION

INTRODUCTION

The TRM provides the ability to rapidly establish a fuel distribution and storage capability at any location, regardless of the availability of construction equipment or material handling equipment. A HEMTT-LHS or PLS can recover the TRM, transport it to a new location, and position the system upon arrival. An empty, full, or partially loaded TRM can be readied for transport, uploaded, and moved in a fraction of the time required for a collapsible tank.

The TRM has a 2,500 gal. (9,464 L) capacity. The TRM is capable of top and bottom fill and can dispense all but residual fuel from discharge hoses. The primary method for dispensing fuel is by use of an electric fuel pump. The fuel pump requires an external power source in the form of a 24 VDC generator or a vehicle. The fuel pump is operated by controls on the TRM or by a 40 ft (12.2 m) remote control switch. Gravity feed is an alternate method for dispensing fuel.

The increased mobility and capability of the HEMTT-LHS and PLS allow direct delivery of bulk fuel to a brigade area. The truck offloads the full TRM in the required position and loads empty TRMs for transport back to the fuel resupply point. The selected site does not require any preparation prior to deployment. The use of the HEMTT-LHS as the prime transporter results in increased cross-country mobility. This increased capability is critical to uninterrupted resupply to maneuvering forces. Operations can continue uninterrupted by replacing empty TRMs with full ones.

The TRM can also be used for line haul of bulk fuel throughout the theater. A PLS or HEMTT-LHS can transport two TRMs – one on the truck and one on the PLS trailer – for a total of up to 5,000 gal. (18,928 L) of bulk petroleum.

The TRM consists of an enhanced flat rack to provide the required interface with the HEMTT-LHS truck, PLS truck and PLS trailer. The TRM fittings, nozzles and other items are compatible with and are currently in inventory for various other fuel handling systems.

The TRM contains:

a. Storage for other equipment necessary for maintenance and refueling operations
b. Pressure relief valves
c. Load stabilization equipment (baffling, surge plates, etc., to minimize shifting of fuel during transport)
d. 2,500 gal. (9,464 L) storage tank with manhole to enter and exit the inside of the tank
e. Tank gauge viewable by a soldier standing on the ground
f. Flow meter
g. Piping manifold
h. Secure storage for hoses and nozzles
i. Secure storage for cables
j. Electric fuel pump, valves, and manifold for fuel distribution
k. Filtration and water separation system

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS

OPERATOR INSTRUCTIONS

DESCRIPTION AND USE OF TRM CONTROLS AND INDICATORS

INTRODUCTION

The following tables and illustrations provide the description and use of the controls and indicators pertaining to the Tank Rack Module (TRM).

TRM CONTROLS AND INDICATORS

Tables 1 thru 9 identify the controls and indicators of the TRM and describe their function.

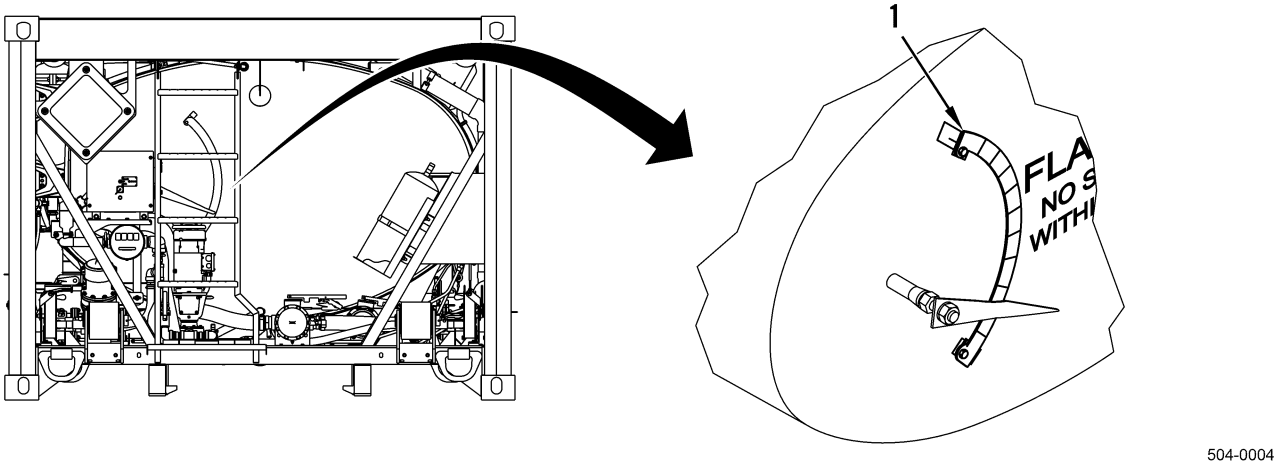


Figure 1. Rear Head Tank Gauge.

Table 1. Rear Head Tank Gauge Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Rear Head Tank Gauge	**NOTE** Amount of fuel in tank can also be determined by gauge stick (WP 0020). Indicates amount of fuel in tank.

TRM CONTROLS AND INDICATORS – CONTINUED

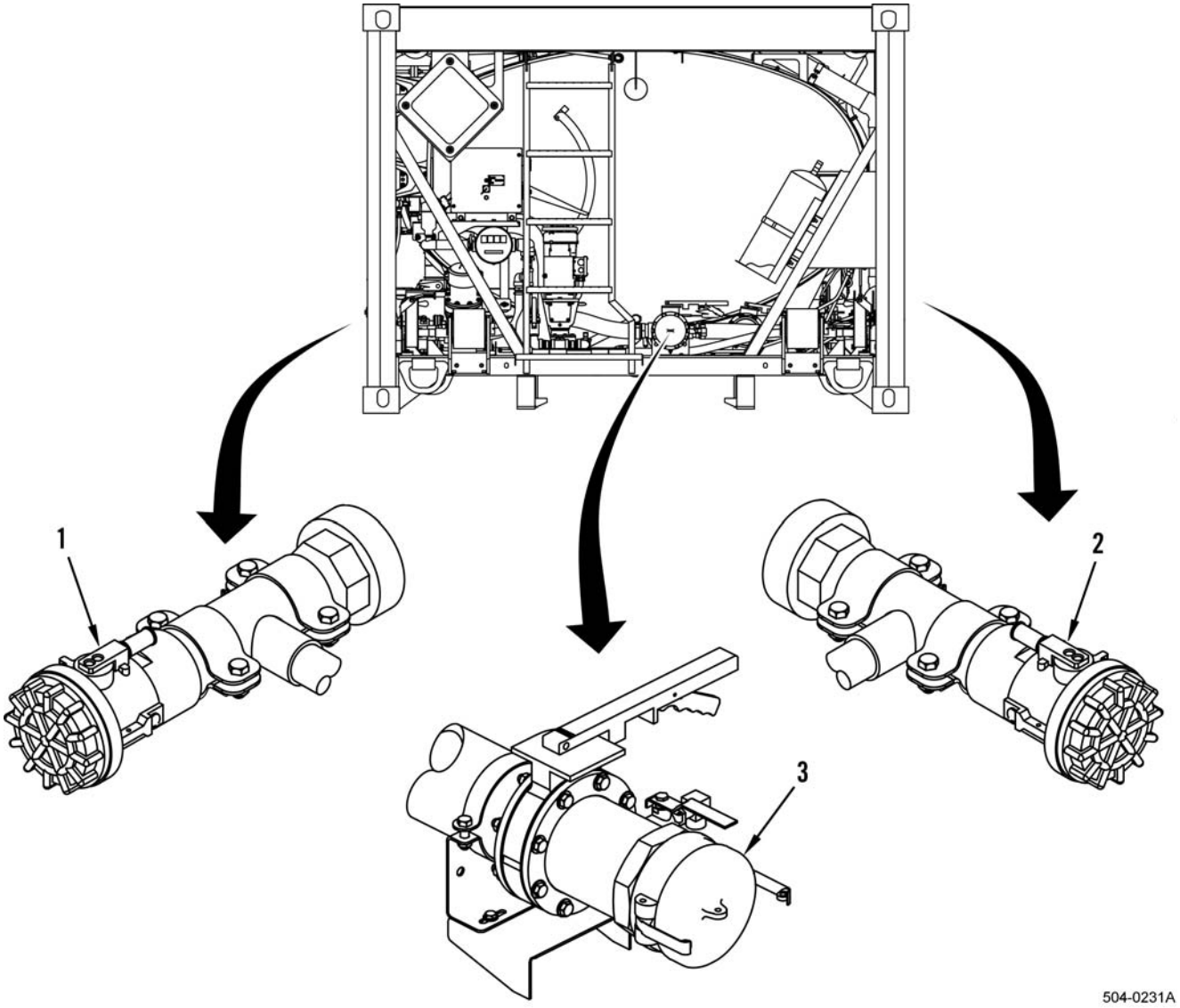


Figure 2. Discharge Piping Assembly.

Table 2. Discharge Piping Assembly Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Discharge Piping Assembly, 2 in. (5.08 cm), Left (Port D, V11 unisex valve)	Discharges fuel.
2	Discharge Piping Assembly, 2 in. (5.08 cm), Right (Port E, V12 unisex valve)	Discharges fuel.
3	Discharge Piping Assembly, 4 in. (10.16 cm), (Port C, V7 butterfly valve)	Controls flow of fuel during bulk discharge operations.

TRM CONTROLS AND INDICATORS – CONTINUED

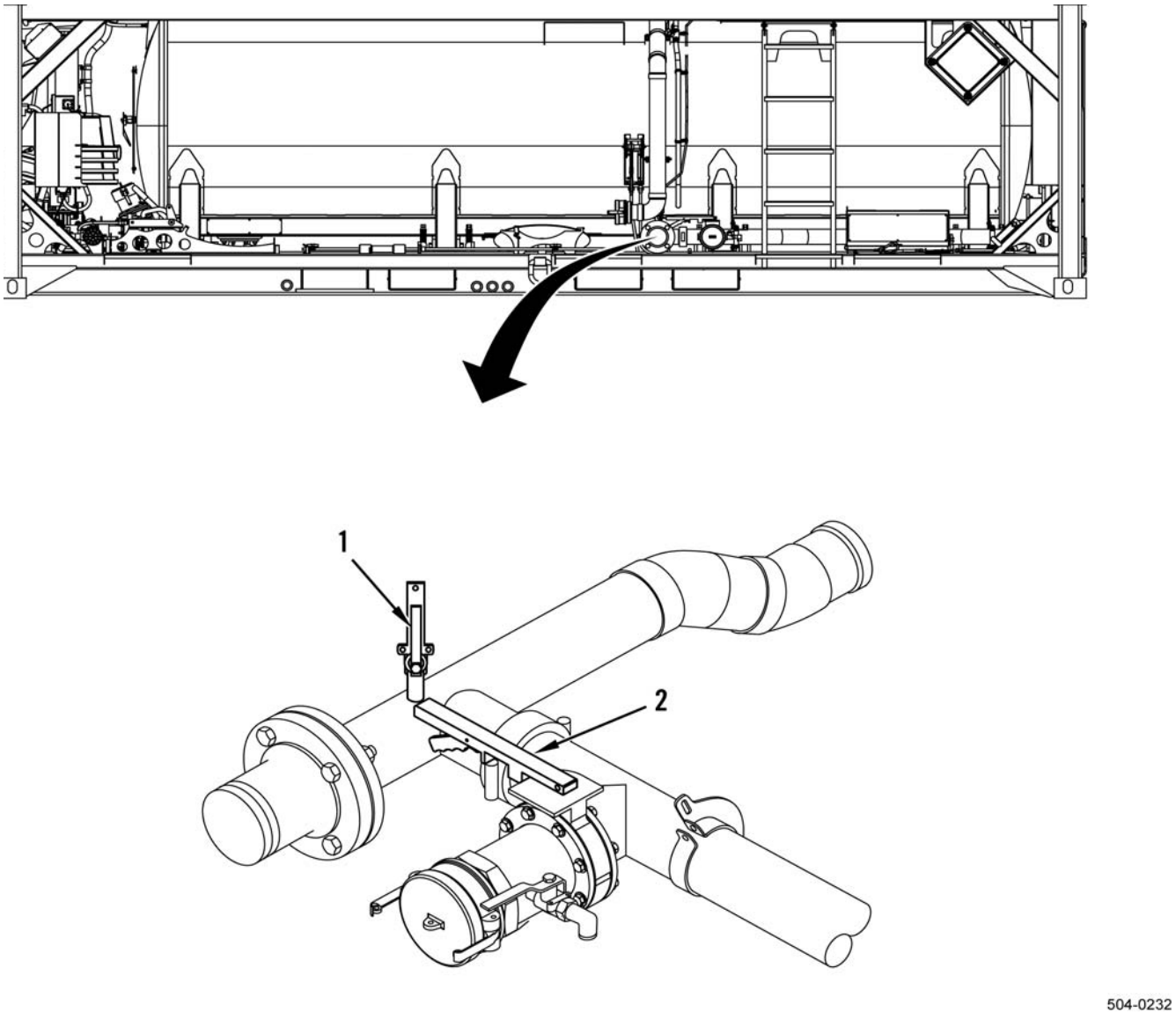


Figure 3. Inlet Piping Butterfly Valve and Precheck Ball Valve.

Table 3. Inlet Piping Butterfly Valve and Precheck Ball Valve Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Precheck Ball Valve (V6)	Controls flow of fuel to liquid level switch.
2	Butterfly Valve, Inlet Piping (V5)	Controls flow of fuel through bottom load inlet piping.

TRM CONTROLS AND INDICATORS – CONTINUED

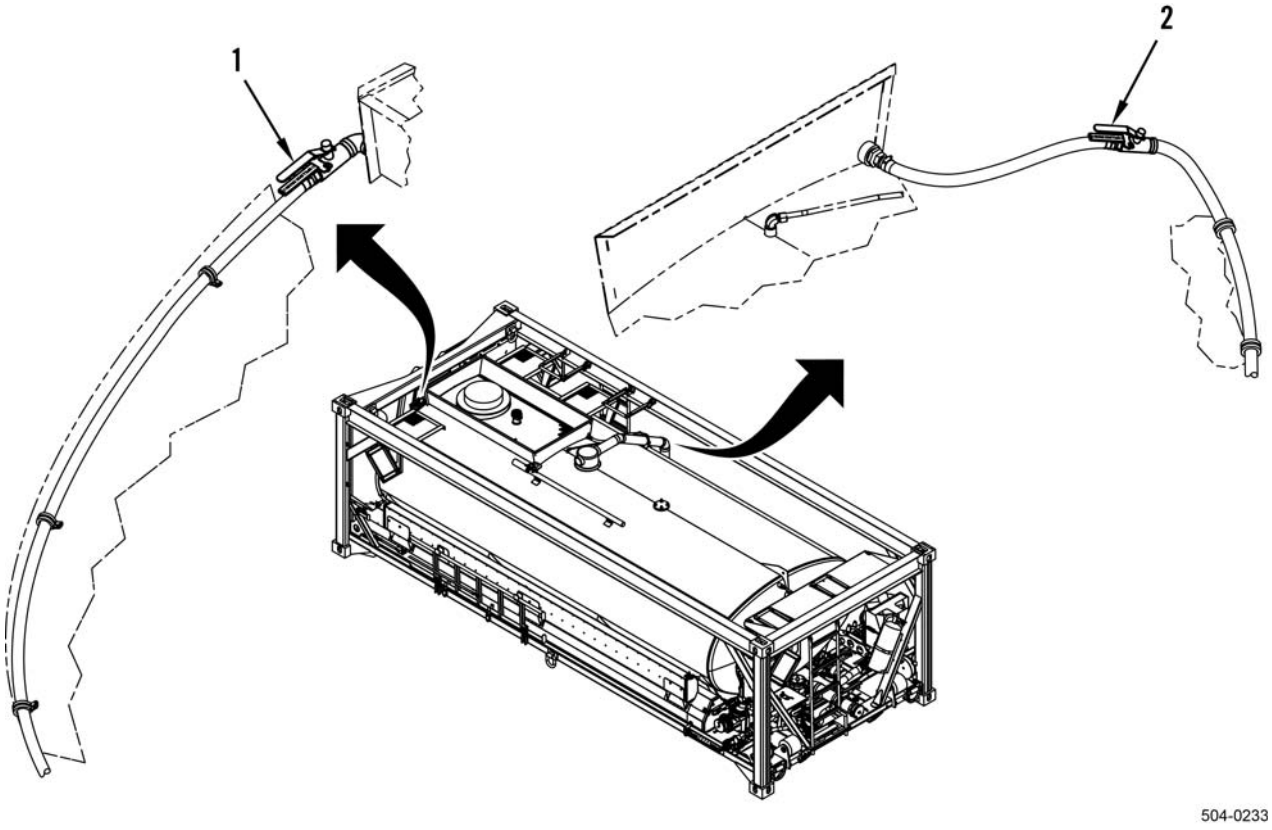


Figure 4. Spillbox Drain Valves.

Table 4. Spillbox Drain Valves Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Spillbox Front Drain Valve	Allows drainage of fuel in spillbox.
2	Spillbox Rear Drain Valve	Allows drainage of fuel in spillbox.

TRM CONTROLS AND INDICATORS – CONTINUED

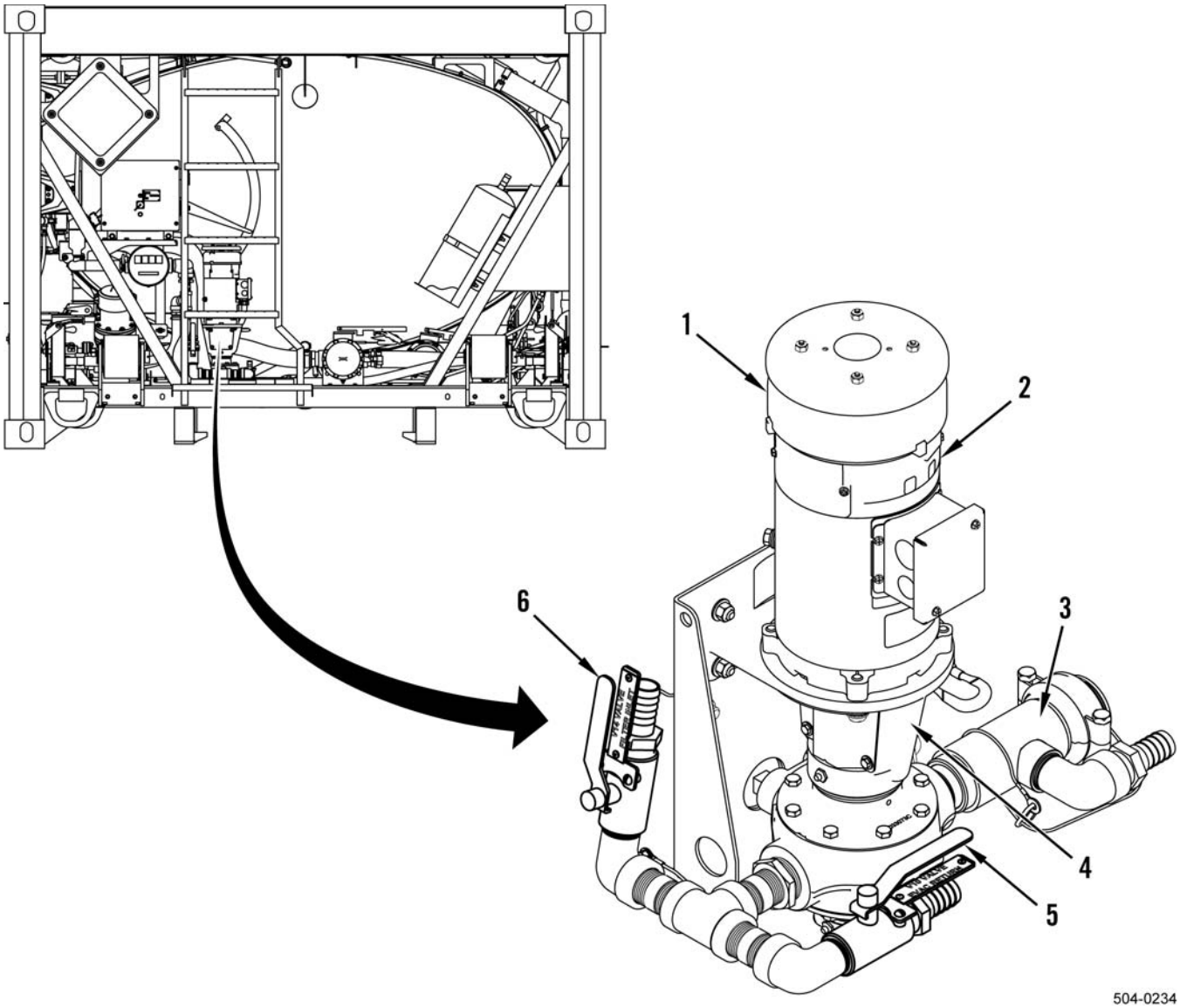


Figure 5. Fuel Pump Assembly.

Table 5. Fuel Pump Assembly Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Fuel Pump Assembly	Motor-driven fuel pump dispenses and evacuates fuel from Port D and Port E hose lines.
2	Fuel Pump Motor (Electric, 1 HP, 24 VDC)	Drives fuel pump.
3	Strainer	Strains fuel entering fuel pump.
4	Fuel Pump (Electric, 22 GPM [83.28 LPM])	Dispenses and evacuates fuel.
5	Control Lever for V10 Valve	Starts and stops fuel flow from evacuation return on tank.
6	Control Lever for V14 Valve	Starts and stops fuel flow to filter/separator inlet.

TRM CONTROLS AND INDICATORS – CONTINUED

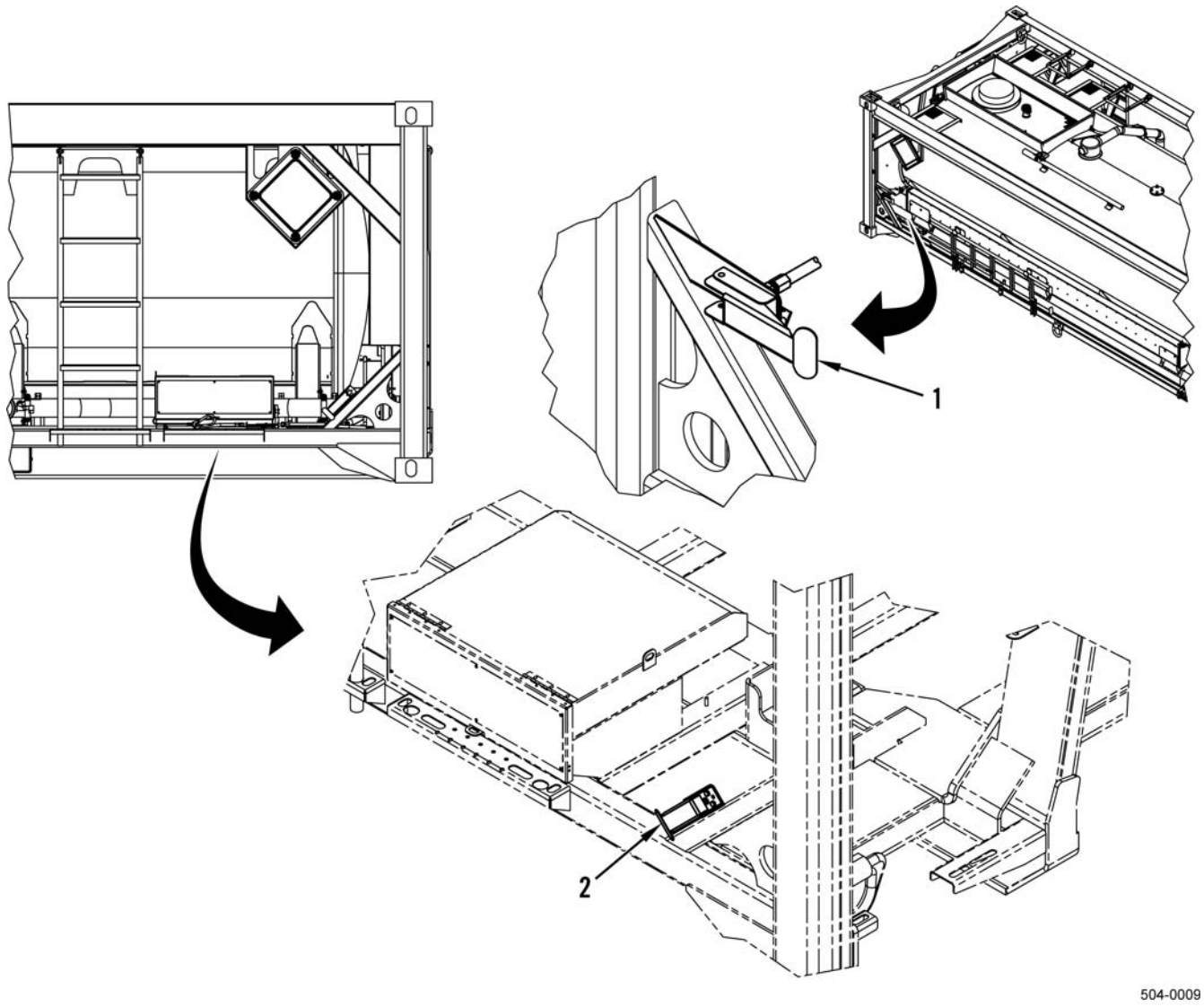


Figure 6. Left and Right Hand Emergency Stop.

Table 6. Left and Right Hand Emergency Stop Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Left Hand Emergency Shutoff Lever (Left)	Immediately stops the fuel flow from tank when activated.
2	Right Hand Emergency Shutoff Lever (Right)	Immediately stops the fuel flow from tank when activated.

TRM CONTROLS AND INDICATORS – CONTINUED

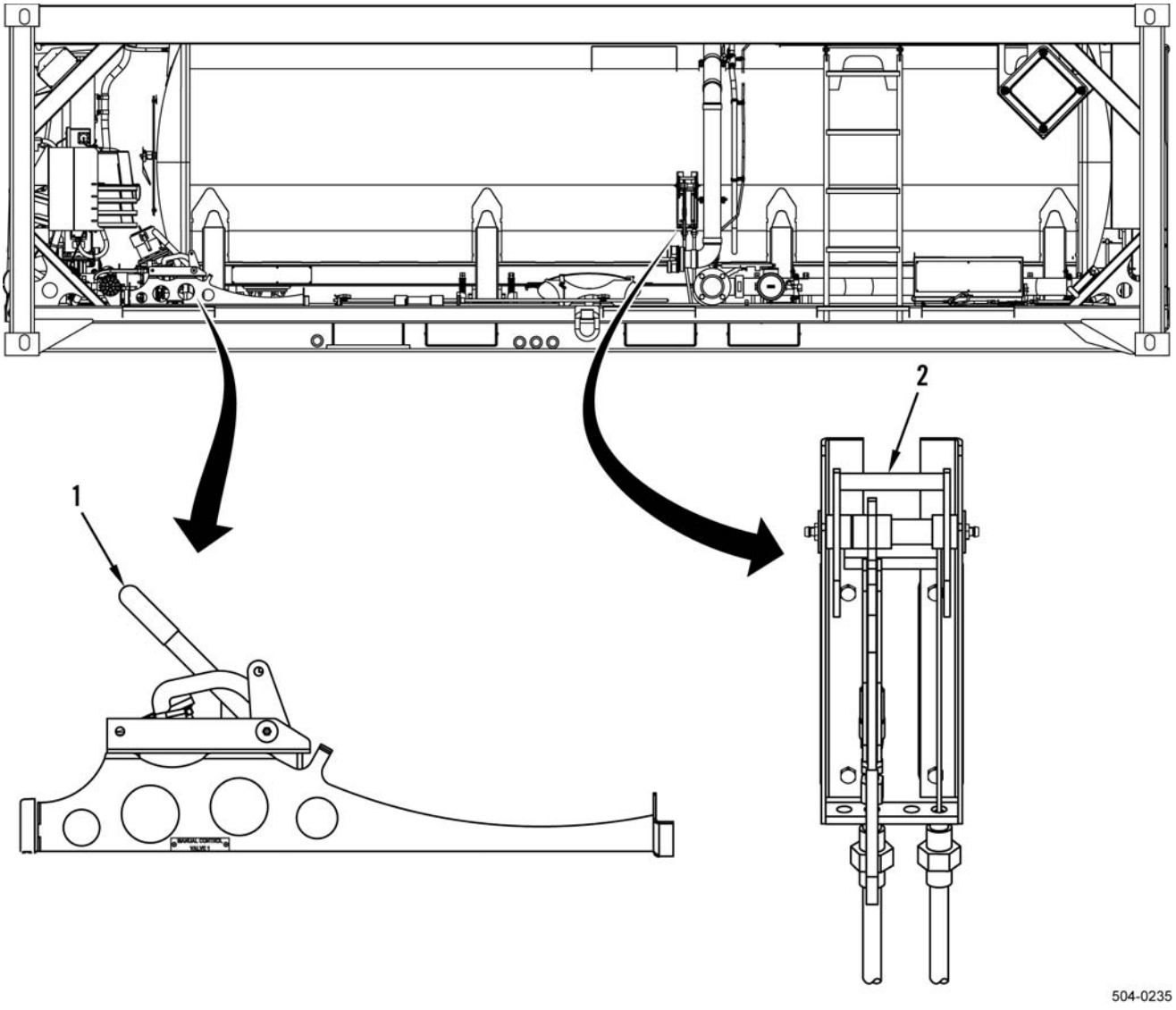


Figure 7. Control Levers for V1 Valve and V2 Valve.

Table 7. V1 Valve and V2 Valve Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Control Lever for V1 Valve	Starts and stops fuel flow from fuel tank to discharge piping assembly through Ports C, D, or E.
2	Control Lever for V2 Valve	Used to manually open and close V2 valve when discharging fuel from the bottom of TRM tank through ports A, B, and G.

TRM CONTROLS AND INDICATORS – CONTINUED

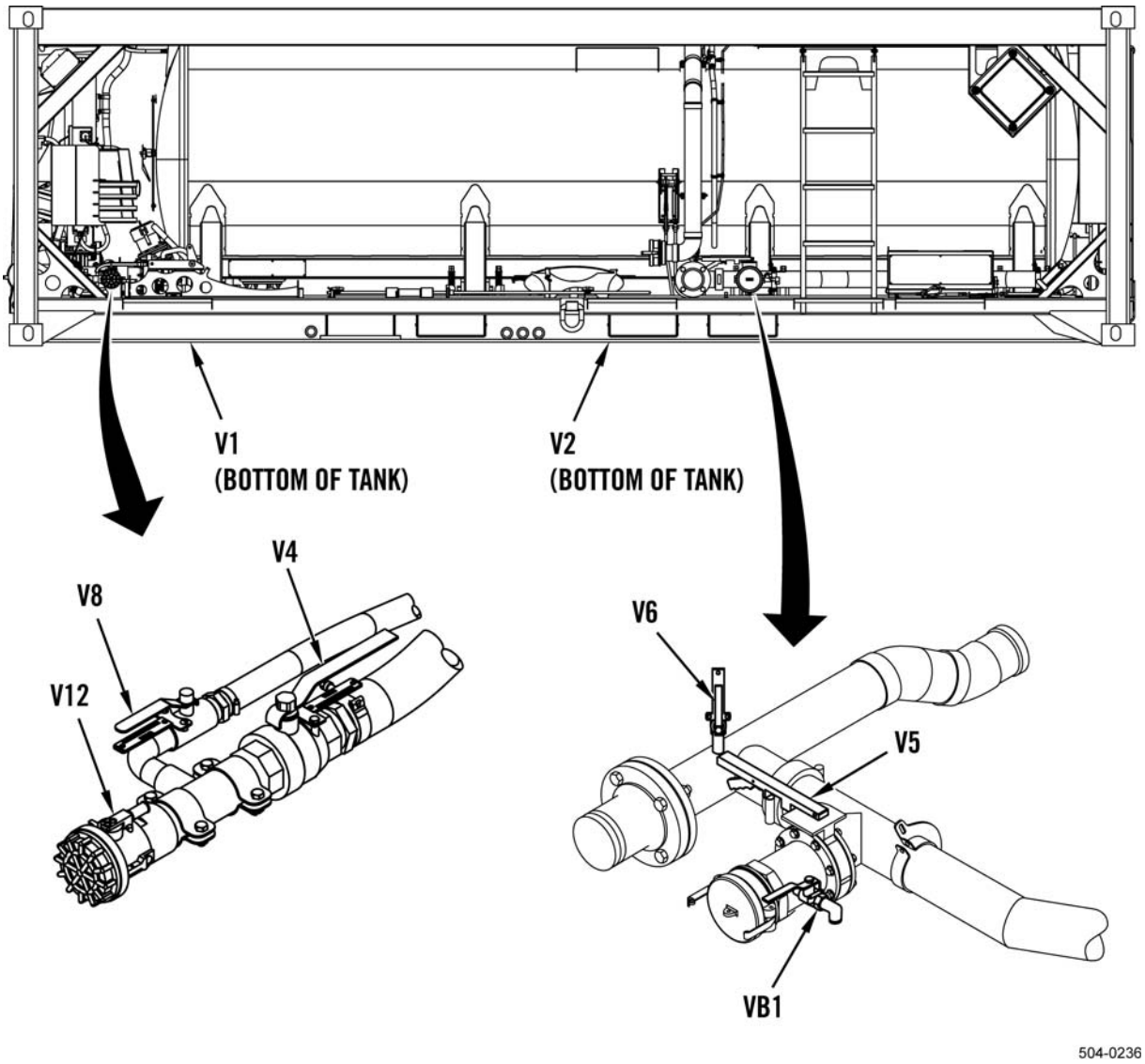


Figure 8. Valve Location (Sheet 1 of 3).

Table 8. Valve Identification.

VALVE	DESCRIPTION
VB1	Vacuum Breaker
V1	Discharge, Port C, D, E
V2	Inlet, Port A, B, G
V4	Discharge, Port E Gravity
V5	Butterfly Valve, Inlet Piping
V6	Precheck Ball Valve
V8	Discharge, Port E Pumped
V12	Unisex Valve, 2 in. (5.08 cm) Port E

TRM CONTROLS AND INDICATORS – CONTINUED

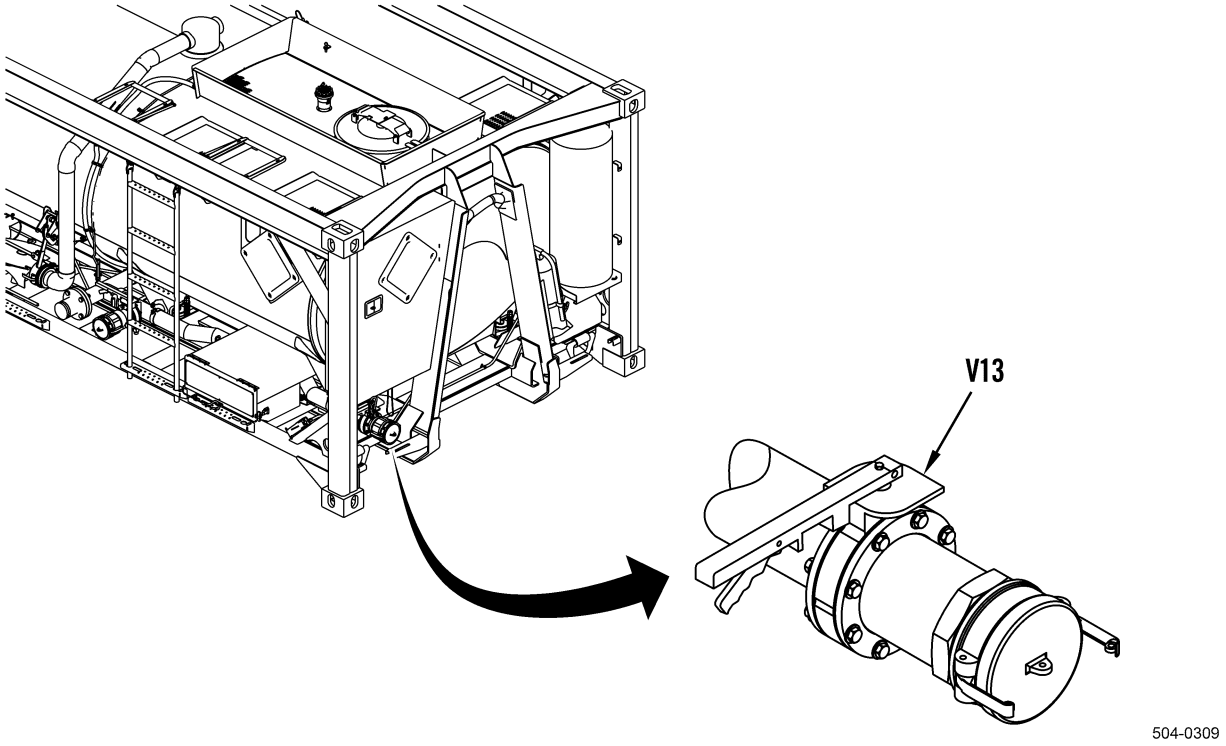


Figure 8. Valve Location (Sheet 2 of 3).

Table 8. Valve Identification - Continued.

VALVE	DESCRIPTION
V13	Butterfly Valve, Inlet Port G

TRM CONTROLS AND INDICATORS – CONTINUED

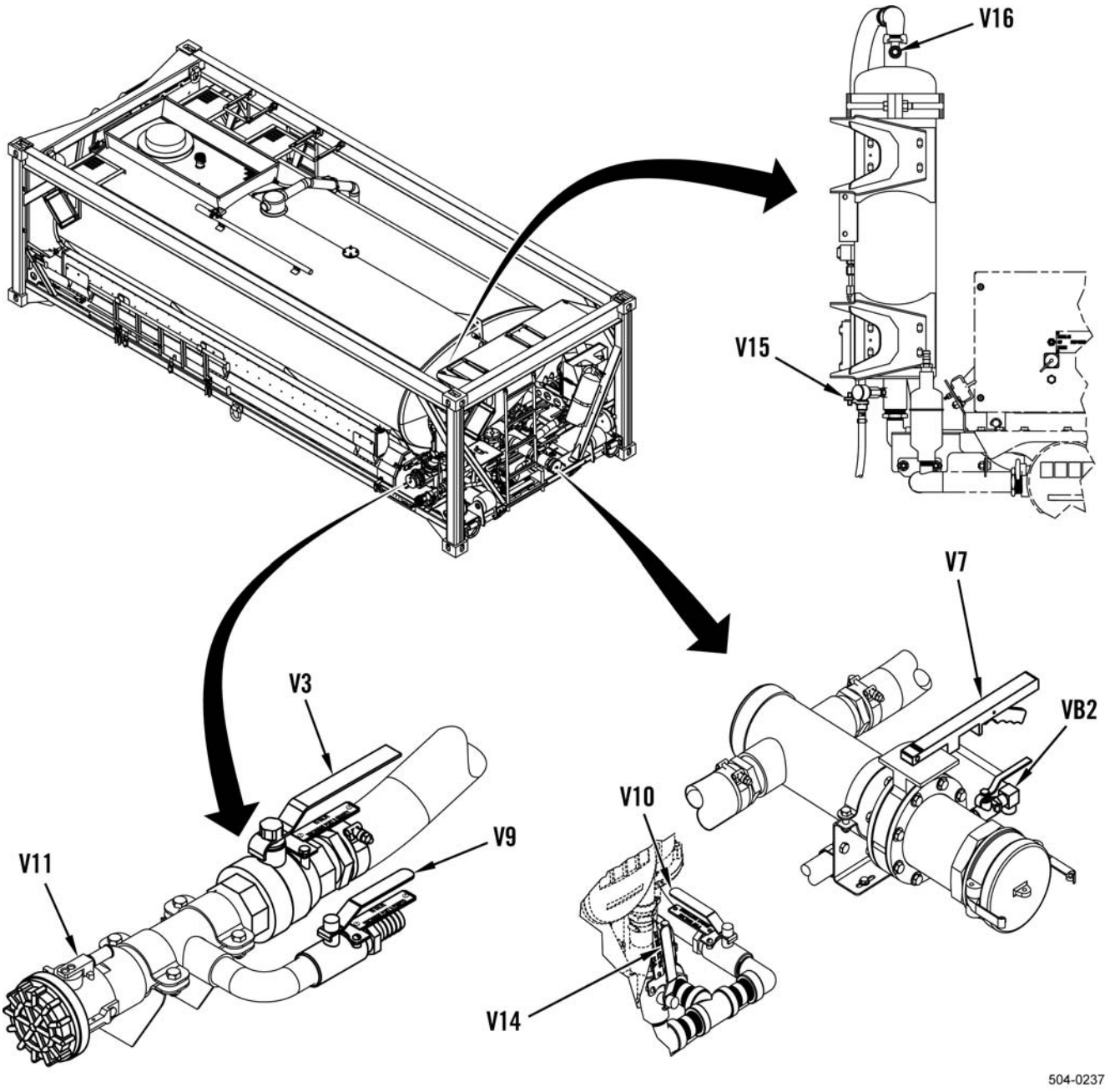


Figure 8. Valve Location (Sheet 3 of 3).

TRM CONTROLS AND INDICATORS – CONTINUED

Table 8. Valve Identification - Continued.

VALVE	DESCRIPTION
VB2	Vacuum Breaker
V3	Discharge, Port D Gravity
V7	Butterfly Valve, Discharge, Port C
V9	Discharge, Port D Pumped
V10	Evacuation Return
V11	Unisex Valve, 2 in. (5.08 cm), Port D
V14	Filter/Separator Inlet
V15	Filter/Separator Drain
V16	Filter/Separator Top Vent

TRM CONTROLS AND INDICATORS – CONTINUED

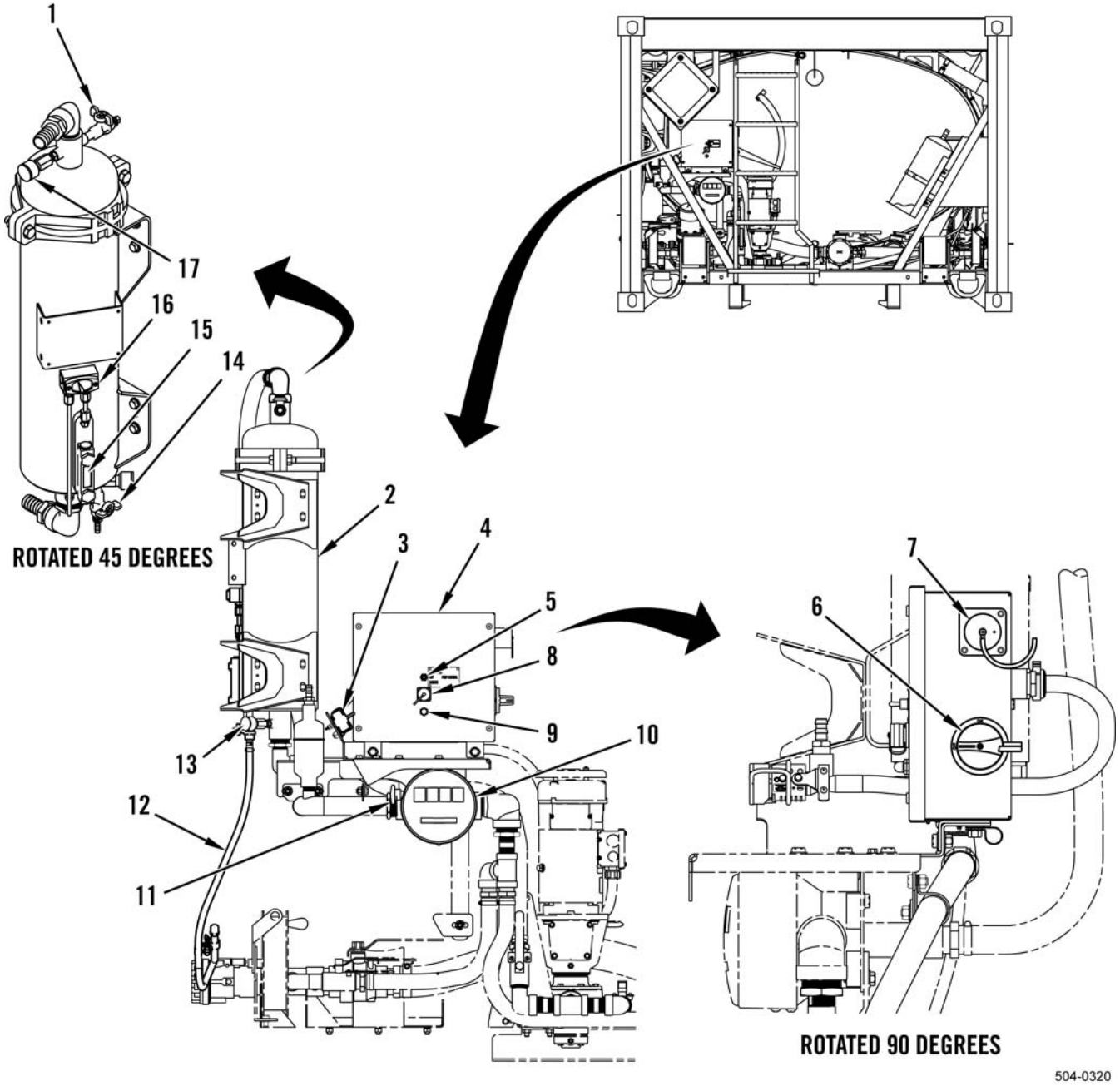


Figure 9. Filter/Separator, Flow Meter, and EMI Control Box.

TRM CONTROLS AND INDICATORS – CONTINUED

Table 9. Filter/Separator, Flow Meter and EMI Control Box Controls and Indicators.

KEY	CONTROL/INDICATOR	FUNCTION
1	Air Vent Valve (V16)	Opens and closes top vent of filter/separator to allow air in while draining water or fuel from bottom drain hose.
2	Filter/Separator	20 GPM, one filter element. Removes undissolved water and solid contaminants from fuel.
3	Power Connector	Connector for slave cable that provides power to EMI control box.
4	EMI Control Box	Provides power to fuel pump from a slave cable connection to a power source. EMI control box includes a main system power slave cable connection, a remote control cable connection, an On/Off/Remote pump control selector switch, and a 2 amp resettable control circuit breaker.
5	Fuel Pump Assembly On/Off/Remote Switch	On position turns pump on, off position turns pump off, and remote position allows the use of the remote switch assembly from up to 40 ft (12 m) away from the EMI control box.
6	Master Switch	Supplies 28 volts to the system when in ON position. Removes power from the system when in OFF position.
7	NATO Slave Connector	Connector for external power source using standard military NATO slave cable.
8	Remote Connector	Connector for remote control switch cable.
9	2 Amp Circuit Breaker Button	Resets the 2 amp circuit breaker.
10	Flow Meter	Measures the quantity of fuel (in gallons) pumped from tank and shows the total gallons pumped.
11	Flow Meter Reset Knob	Resets flow meter register to zero.
12	Drain Hose	Drains water and fuel from filter/separator.
13	Upstream Sample Port (Inlet H)	Dry-connect fitting for fuel sampling.
14	Drain Valve (V15)	Opens and closes drain of filter/separator to evacuate water and drain fuel.
15	Sight Gauge	Shows the level of collected water within the filter/separator sump. A float ball indicates when the water should be discharged using drain valve V15.
16	Differential Pressure Gauge	Displays the pressure difference across filter/separator elements. When filter elements become contaminated, fuel flow through the elements is restricted, causing an increase in pressure.
17	Downstream Sample Port (Outlet J)	Dry-connect fitting for fuel sampling.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
PREPARATION FOR USE
Emplacement and Setup Requirements, TRM Prior to Start Procedures

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0017
WP 0023
WP 0060

CAUTION

The TRM should be assembled on a level area free of debris and large rocks. Special care should be taken to ensure that no hose assemblies will be placed on or near rocks or other objects that may have sharp points or edges which may damage the hose assemblies when the fuel system is operated. Be sure that the site allows for enough room to assemble the fuel system. Failure to comply may cause damage to equipment.

NOTE

Ensure the site has adequate space for TRM operations, and a road network that can safely move vehicles from a marshalling site to the refuel points and back to another post marshalling site. The selected site should have adequate space for storage and parking of vehicles. Parking of vehicles at distribution points should take into consideration all types of vehicles, terrain, and drainage requirements, if inclement weather is present during operations. An improved surface is recommended for the retail points. Site should provide for cover and concealment and should be located at a safe distance from populated areas to prevent congestion.

EMPLACEMENT AND SETUP REQUIREMENTS

1. Prepare site per FM 10-67-1, Concepts and Equipment of Petroleum Operations and ATP 4-43, Petroleum Supply Operations.

NOTE

On hard surfaces such as asphalt or concrete, place rollers under TRM (WP 0023).

2. Lower TRM (WP 0017).
3. Mark location of TRM receiving and issuing points in accordance with mission requirements.

EMPLACEMENT AND SETUP REQUIREMENTS - CONTINUED

NOTE

Conduct ground and bond procedures for the TRM, as described in ATP 4-43 and FM 10-67-1. Position ground rods at an appropriate distance (3 to 5 ft [0.91 to 1.52 m]) from TRM, as not to impede fueling operations.

4. Drive ground rod a minimum of 3 ft (0.91 m) into the ground and attach one TRM static reel cable.
5. Attach second TRM static reel cable to a designated ground point or on bare metal of vehicle.
6. Ensure safety and fire procedures are followed as described in FM 10-67-1 and ATP 4-43.
7. Perform (BEFORE) Preventive Maintenance Checks and Services (PMCS) (WP 0060).

END OF TASK

TRM PRIOR TO START PROCEDURES

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction. Failure to comply could result in injury or death to personnel.

1. Perform (BEFORE) PMCS checks (WP 0060).
2. Ensure all valves (V1-V16) are in closed position (WP 0004).

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
PREPARATION FOR RETAIL OPERATION
Connect Power Using NATO Cable End, Disconnect Power Using NATO Cable End, Connect to External Power Source Using Genset Cable End, Disconnect from External Power Source Using Genset Cable End

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)

Materials/Parts

Cable assembly, genset (WP 0066, Table 1, Item 18)

Cable assembly, NATO (WP 0066, Table 1, Item 20)

Cable assembly, pump control (WP 0066, Table 1, Item 21)

Cable assembly, slave, 40 ft (WP 0066, Table 1, Item 19)

Materials/Parts - Continued

Switch box assembly (WP 0066, Table 1, Item 22)

Personnel Required

Two

References

ATP 4-43

FM 10-67-1

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

- Connect only using an approved North Atlantic Treaty Organization (NATO) cable that does not have loose or missing insulation. Electric shock could occur, leading to injury or death.
- Do not proceed if suitable cable is not available.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Discharge static electricity before fueling operations by touching a metal surface away from fuel nozzle. Static electricity may cause fuel to ignite.
- Cellular phones or other electronic devices must not be used within 25 ft (7.6 m) of TRM. Use of cellular phones and other electronic devices during fueling may cause fuel to ignite.
- Do not wear wool, nylon, silk, rayon, or other items having a tendency to generate static electricity. Static electricity may cause fuel to ignite.
- Wear clean cotton clothing with no metal buttons, zippers or fasteners. Remove all contents from pockets. Static electricity from metal objects may cause fuel to ignite.
- Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

PREPARATION FOR RETAIL OPERATION

Connect Power Using NATO Cable End

1. Turn red master switch (Figure 1, Item 2) on side of EMI control box (Figure 1, Item 1) to OFF and set fuel pump assembly control toggle switch (Figure 1, Item 3) on front cover of EMI control box to OFF.
2. Connect 40 ft (12.2 m) slave cable (Figure 1, Item 7) to 28 VDC power input connector (Figure 1, Item 8) near EMI control box (Figure 1, Item 1).
3. Connect opposite end of 40 ft (12.2 m) slave cable (Figure 1, Item 7) to 28 VDC power source using NATO cable end (Figure 2).
4. Connect one end of 40 ft (12.2 m) remote control cable (Figure 1, Item 6) to EMI control box connector (Figure 1, Item 4) and connect remote control switch (Figure 1, Item 5) to opposite end of remote control cable.

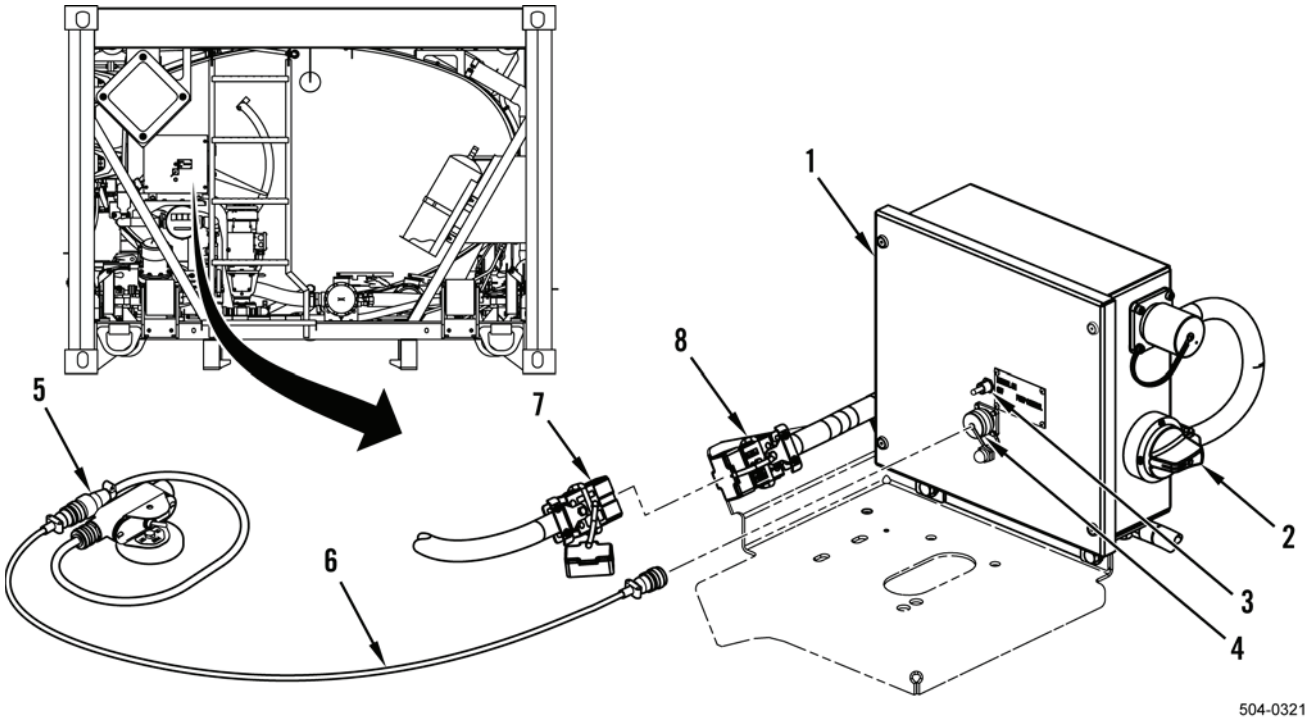


Figure 1. 28 VDC Power Connection.

Connect Power Using NATO Cable End - Continued

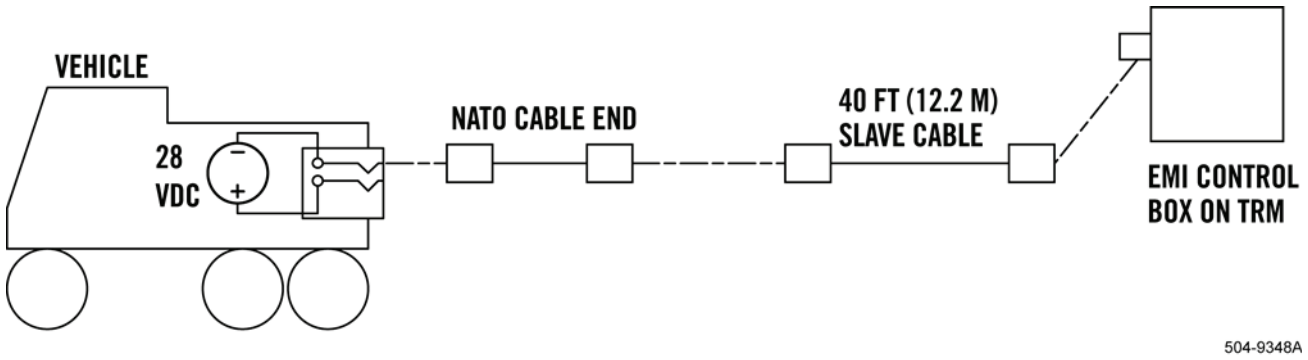


Figure 2. Cable Connections Using NATO Cable End.

5. Rotate reset knob (Figure 3, Item 3) on flow meter (Figure 3, Item 1) clockwise to set flow meter register (Figure 3, item 2) to zero.

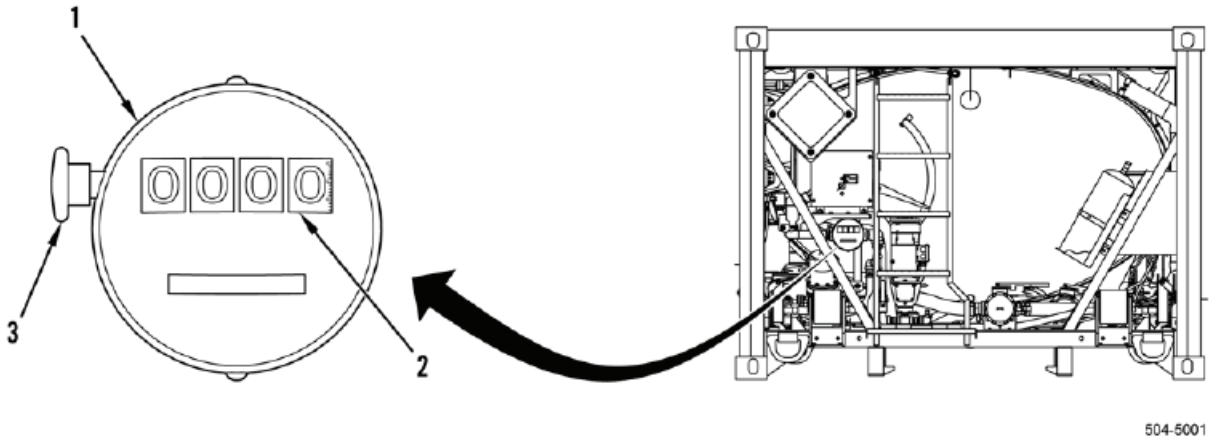


Figure 3. Flow Meter.

END OF TASK

Disconnect Power Using NATO Cable End

1. Set fuel pump assembly toggle switch (Figure 4, Item 3) on front cover of EMI control box (Figure 4, Item 1) to OFF and turn red master switch (Figure 4, Item 2) on side of EMI control box to OFF after completion of fueling or evacuation operation.
2. Disconnect NATO cable end from 28 VDC power source and from 40 ft (12.2 m) slave cable.
3. Disconnect 40 ft (12.2 m) slave cable (Figure 4, Item 7) from 28 VDC power input connector (Figure 4, Item 8) near EMI control box (Figure 4, Item 1). Install dust caps on slave cable, 28 VDC power input connector, and NATO end cable.
4. Disconnect 40 ft (12.2 m) remote control cable (Figure 4, Item 6) from EMI control box connector (Figure 4, Item 4). Install dust cap on EMI control box connector.
5. Disconnect remote control switch (Figure 4, Item 5) from 40 ft (12.2 m) remote control cable (Figure 4, Item 6). Install dust caps.
6. Stow all equipment.

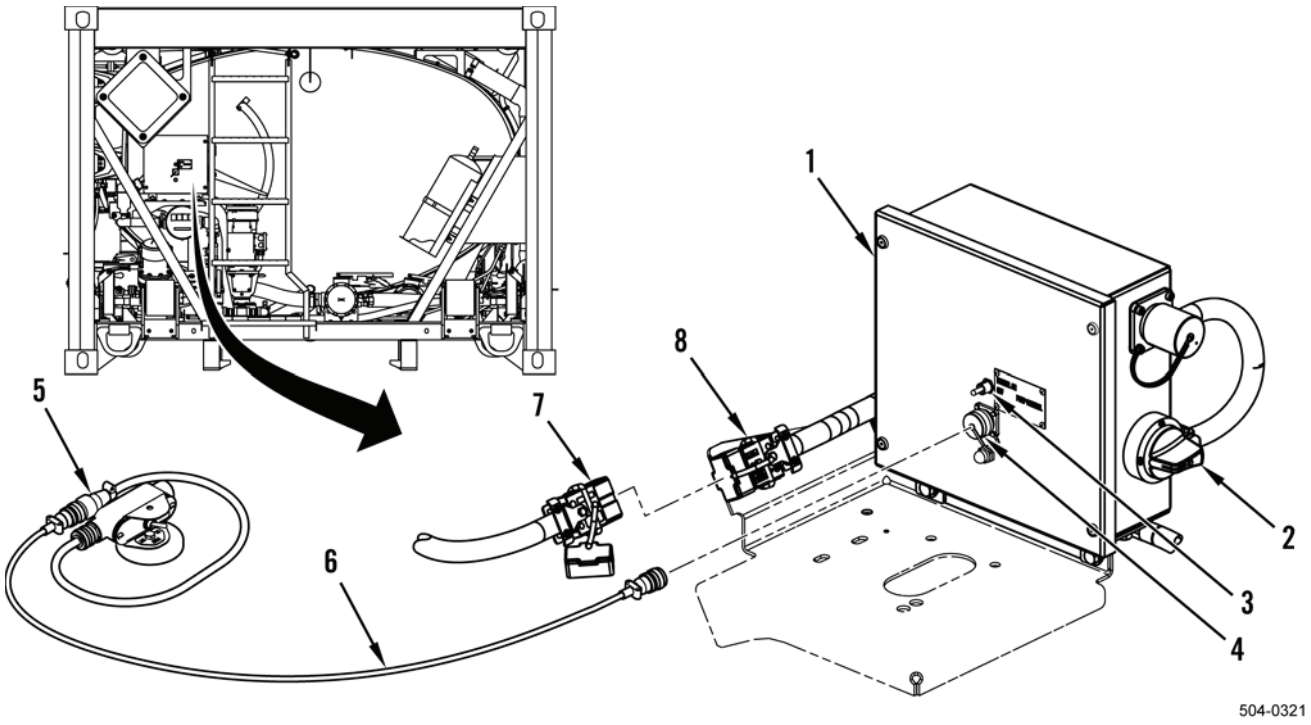


Figure 4. 28 VDC Power Disconnection.

END OF TASK

Connect to External Power Source Using Genset Cable End

1. Turn red master switch (Figure 4, Item 2) on side of EMI control box (Figure 4, Item 1) to OFF and set fuel pump assembly control toggle switch (Figure 4, Item 3) on front cover of EMI control box to OFF.
2. Connect 40 ft (12.2 m) slave cable (Figure 4, item 7) to 28 VDC power input connector (Figure 4, item 8) near EMI control box.
3. Contact Field Maintenance to connect genset cable end to external 28 VDC power source.
4. Connect opposite end of 40 ft (12.2 m) slave cable (Figure 4, item 7) to genset cable end and start external power source to maintain 24-28 VDC power (Figure 5).
5. Connect one end of 40 ft (12.2 m) remote control cable (Figure 4, Item 6) to EMI control box connector (Figure 4, Item 4) and connect remote control switch (Figure 4, Item 5) to opposite end of remote control cable.

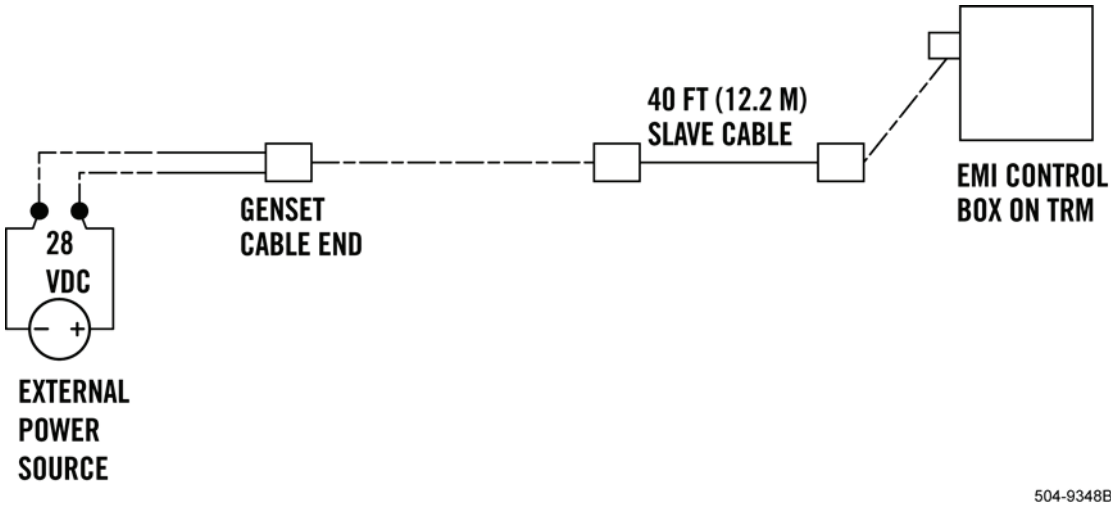


Figure 5. Cable Connections Using Genset Cable End.

Connect to External Power Source Using Genset Cable End - Continued

6. Rotate reset knob (Figure 6, Item 3) on flow meter (Figure 6, Item 1) clockwise to set flow meter register (Figure 6, item 2) to zero.

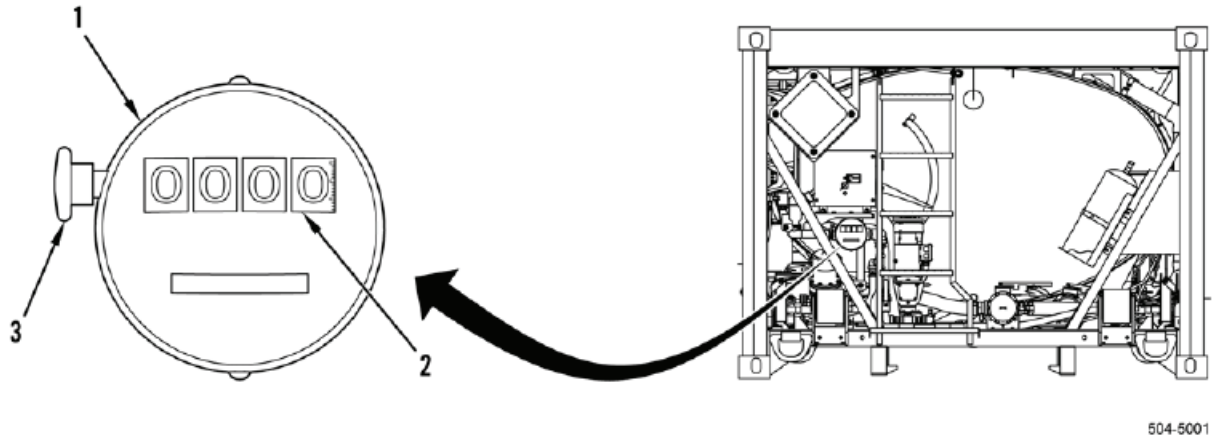


Figure 6. Flow Meter.

END OF TASK

Disconnect from External Power Source Using Genset Cable End

1. Set fuel pump assembly toggle switch (Figure 7, Item 3) on front cover of EMI control box (Figure 7, Item 1) to OFF and turn red master switch (Figure 7, Item 2) on side of EMI control box to OFF after completion of fueling or evacuation operation.
2. Turn off external power source.
3. Disconnect 40 ft (12.2 m) slave cable (Figure 7, Item 7) from genset cable end.
4. Contact Field Maintenance to disconnect genset cable end from external power source.
5. Disconnect opposite end of 40 ft (12.2 m) slave cable (Figure 7, Item 7) from 28 VDC power input connector (Figure 7, Item 8) near EMI control box (Figure 7, Item 1). Install dust caps on slave cable and 28 VDC power input connector.
6. Disconnect 40 ft (12.2 m) remote control cable (Figure 7, Item 6) from EMI control box connector (Figure 7, Item 4). Install dust cap on EMI control box connector.
7. Disconnect remote control switch (Figure 7, Item 5) from 40 ft (12.2 m) remote control cable (Figure 7, Item 6). Install dust caps on remote control switch cable and 40 ft (12.2 m) remote control cable.
8. Stow all equipment.

Disconnect from External Power Source Using Genset Cable End - Continued

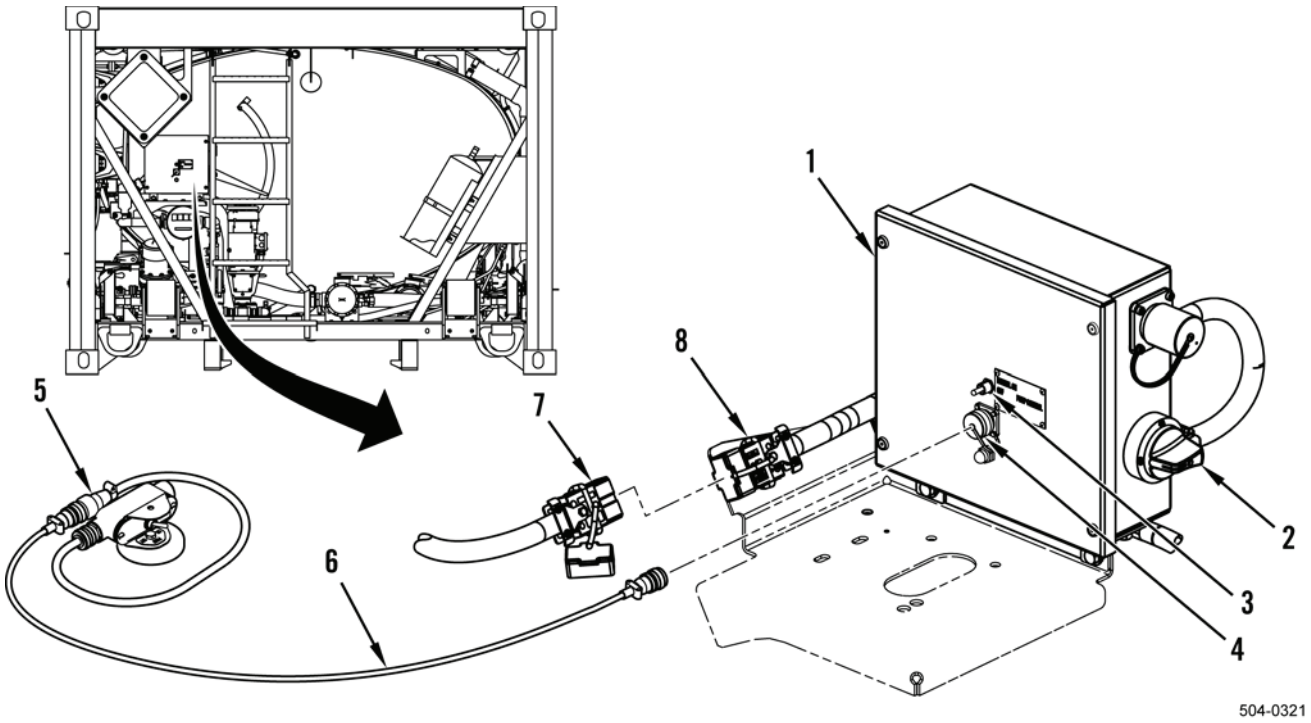


Figure 7. 28 VDC Power Disconnection.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
TOP LOADING PORT F

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

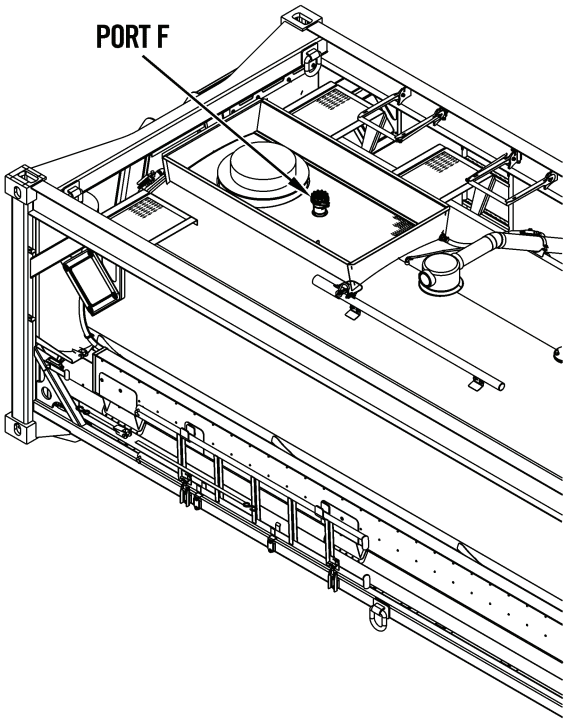
TOP LOADING PORT F PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from Port F.
4. Insert nozzle from external fuel source into Port F.



504-0019

Figure 1. Top Loading TRM Port F.

TOP LOADING PORT F PROCEDURES – CONTINUED

5. Remove dust cap from bottom of vapor recovery line.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

6. Start external transfer pump.
7. Begin top load fueling operations through Port F (Figure 1).
8. Shut down external transfer pump.
9. Install dust cap on Port F
10. Close manhole cover and install dust cap on bottom of vapor recovery line.
11. Remove drip pan and dispose of contents per local Standard Operating Procedures (SOP).

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
BOTTOM LOADING PORT B

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

BOTTOM LOADING PORT B PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Connect 4 in. (10.16 cm) discharge fuel hose from external transfer pump to Port B (Figure 1).
4. Open V5 valve (Figure 1).
5. Remove dust cap from bottom of vapor recovery line.
6. Start external transfer pump and begin fueling operation through Port B (Figure 1).

NOTE

TRM must be on level ground for liquid level switch and fuel tank gauge to operate properly. Liquid level switch detects when fuel has reached maximum fill level of 2,500 gal. (9,464 L). When TRM is full, liquid level switch closes V2 valve and stops fuel flow into TRM.

7. Open V6 valve (Figure 1) to verify operation of liquid level switch. Fuel flow should stop in approximately 15 seconds.
   a. Close V6 valve (Figure 1) if liquid level switch is operational.
   b. Close V6 valve (Figure 1) and have second 92F observe fuel flow from manhole cover if liquid level switch is not operational.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

8. Continue fueling operations.
9. Shut off external transfer pump, and close V5 valve (Figure 1) after loading is complete.
10. Reverse fuel flow using external transfer pump to initiate hose evacuation.
11. Place suitable container under vacuum breaker VB1 valve (Figure 1) and slowly open VB1 valve.
12. Disconnect hose connection carefully at Port B (Figure 1) to assist hose evacuation. Verify vacuum is present.
13. Lift hose end disconnected from Port B above height of supply source for approximately two minutes to assist in hose evacuation.

BOTTOM LOADING PORT B PROCEDURES – CONTINUED

14. Close supply source valve and shut off external transfer pump.
15. Carefully discharge residual fuel from 4 in. (10.16 cm) x 15 ft (4.6 m) suction hose into drip pans.
16. Carefully disconnect 4 in. (10.16 cm) discharge fuel hose from supply source and discharge any remaining fuel into drip pans.
17. Install dust cap and plug on hose, Port B, and bottom of vapor recovery line.
18. Close manhole cover.
19. Remove drip pans and containers and dispose of contents per local SOP.

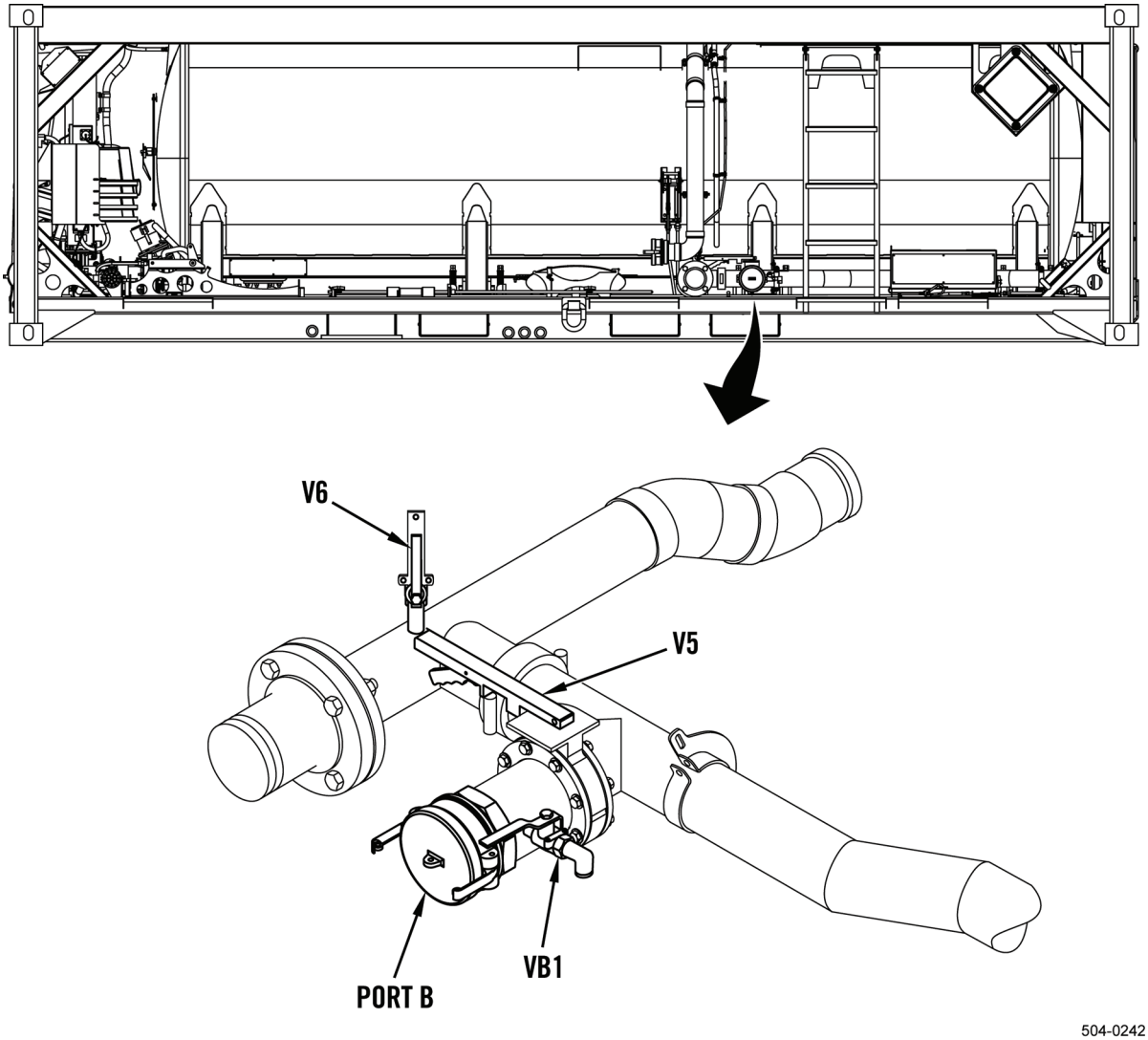


Figure 1. Bottom Loading Port B.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
BULK LOAD THROUGH PORT B USING NATO ADAPTER

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Parts kit, quick-disconnect coupling assembly (NATO adapter assembly, male) (WP 0066, Table 1, Item 14)
Reducer, quick-disconnect, 3 to 4 in. (7.62 cm to 10.16 cm) (WP 0066, Table 1, Item 11)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

BULK LOAD THROUGH PORT B PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Open vacuum breaker VB1 valve (Figure 1) slowly.
5. Remove Port B plug and connect quick-disconnect reducer to Port B (Figure 1).
6. Remove dust caps from male NATO adapter.
7. Connect male NATO adapter to reducer (Figure 1).
8. Connect from NATO asset female adapter to male NATO adapter (Figure 1).
9. Open V5 valve (Figure 1).
10. Start NATO asset pump and begin fueling operation through Port B (Figure 1).

NOTE

TRM must be on level ground for liquid level switch and fuel tank gauge to operate properly. Liquid level switch detects when fuel has reached maximum fill level of 2,500 gal. (9,464 L). When TRM is full, liquid level switch closes V2 valve and stops fuel flow into TRM.

11. Open V6 valve (Figure 1) to verify operation of liquid level switch. Fuel flow should stop in approximately 15 seconds.
    a. Close V6 valve (Figure 1) if liquid level switch is operational.
    b. Close V6 valve (Figure 1) if liquid level switch is not operational and have second 92F observe fuel flow from manhole cover.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

12. Continue fueling operations.
13. Close V5 and shut off NATO asset pump after loading is complete.

BULK LOAD THROUGH PORT B PROCEDURES – CONTINUED

14. Disconnect NATO asset female adapter from male NATO adapter (Figure 1).
15. Open vacuum breaker VB1 valve (Figure 1) slowly.
16. Remove male NATO adapter, drain residual fuel, and put caps on.
17. Disconnect reducer from Port B and plug Port B (Figure 1).
18. Install dust cap on bottom of vapor recovery line.
19. Close manhole cover.
20. Remove drip pan and dispose of contents per local SOP.

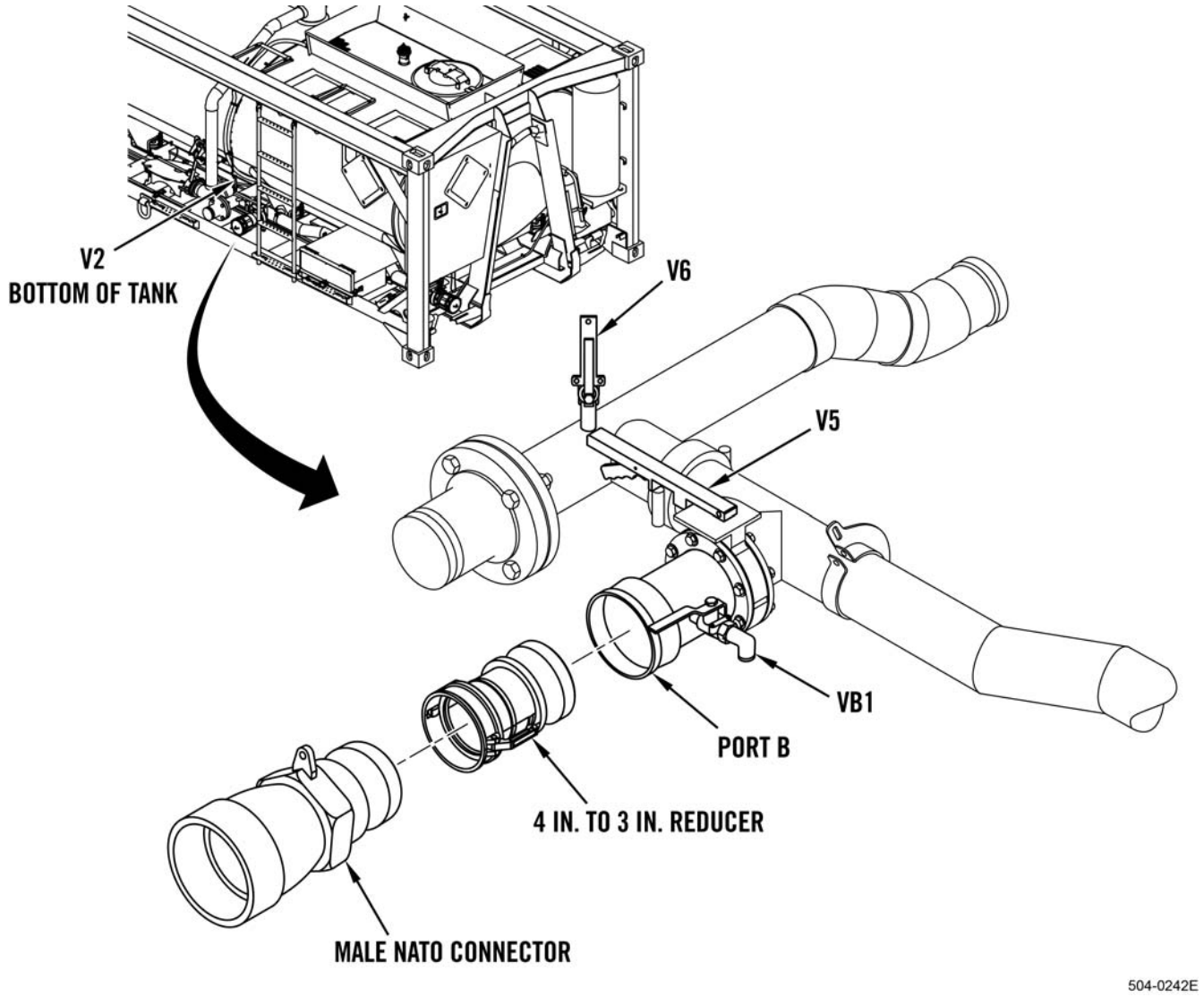


Figure 1. Bulk Load Through Port B Using NATO Adapter.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
BOTTOM LOADING PORT A

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

BOTTOM LOADING PORT A PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Connect D1 nozzle from external transfer pump to Port A (Figure 1).
4. Open valve on D1 nozzle.
5. Remove dust cap from bottom of vapor recovery line.
6. Start external transfer pump and begin fueling operation.

NOTE

TRM must be on level ground for liquid level switch and fuel tank gauge to operate properly. Liquid level switch detects when fuel has reached maximum fill level of 2,500 gal. (9,464 L). When TRM is full, liquid level switch closes V2 valve and stops fuel flow into TRM.

7. To verify operation of liquid level switch, open V6 valve (Figure 1). Fuel flow should stop in approximately 15 seconds.
   a. Close V6 valve if liquid level switch is operational.
   b. Close V6 valve if liquid level switch is not operational and have second 92F observe fuel flow from manhole cover.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

8. Continue fueling operations.

BOTTOM LOADING PORT A PROCEDURES – CONTINUED

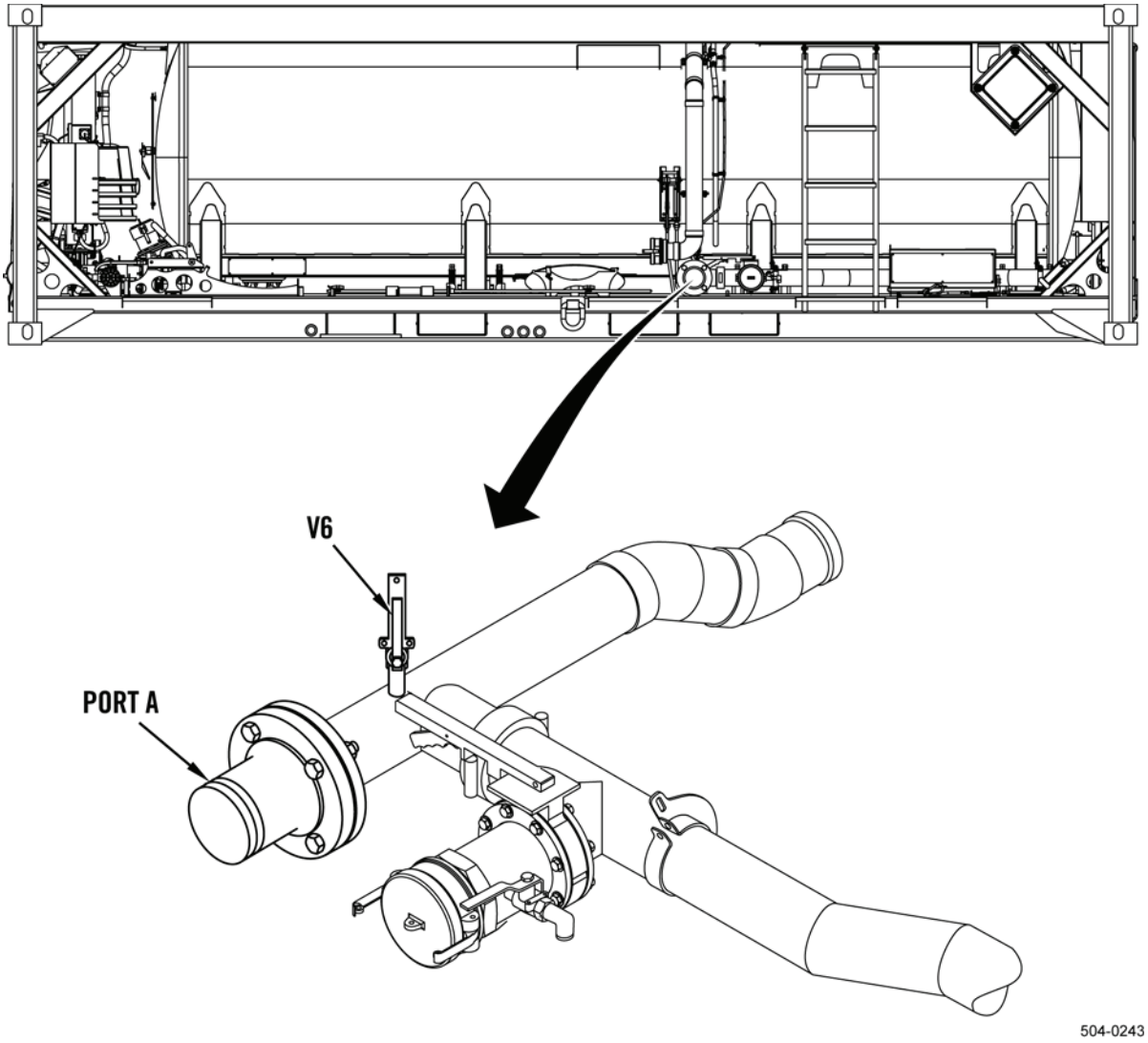


Figure 1. Bottom Loading Port A.

9. Shut off external transfer pump and close valve on D1 nozzle after loading is complete.
10. Evacuate hoses using external transfer pump.
11. Disconnect D1 nozzle from Port A (Figure 1).
12. Install dust caps on D1 nozzle, Port A, and bottom of vapor recovery line.
13. Close manhole cover.
14. Remove drip pan and dispose of contents per local SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
RECIRCULATE FUEL

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Hose, discharge, 2 in. x 13 ft (5.08 cm x 3.96 m) (WP 0066, Table 1, Item 2) Qty: 2

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0015
WP 0060

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010, WP 0018)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

RECIRCULATE FUEL

1. Close all valves (V1 - V16).
2. Place drip pan under Port D and remove Port D dust cap (Figure 1).
3. Remove two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses from hose trough on TRM.
4. Remove dust cap from one 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose and connect hose to Port D (Figure 1).
5. Connect dust caps from 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose and Port D to maintain integrity of seals.
6. Open unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose at Port D end.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

7. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
8. Remove dust cap from bottom of vapor recovery line.

NOTE

A second 92F can lift the weight of the 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to help the 92F at Port F disconnect the hose.

9. Remove dust caps from Port F and second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose and connect 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to port F.
10. Open unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose at Port F end.
11. Connect two dust caps from 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose and Port F to maintain integrity of seals.
12. Place drip pan under connection point of two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses and remove dust caps from ends of 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses.
13. Connect ends of two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses and open unisex valves on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose ends (Figure 1) to lock in place.
14. Connect two dust caps from 2 in. x 13 ft (5.08 cm x 3.96 m) hoses to maintain integrity of seals.

NOTE

Minimum recirculation requirement is 50 percent of loaded fuel.

15. Open V9 and V11 valves to discharge from Port D and recirculate fuel.
16. Open V1 valve to allow fuel flow from tank to fuel pump assembly.
17. Open V14 valve to allow fuel flow from fuel pump assembly to filter/separator.

RECIRCULATE FUEL - CONTINUED

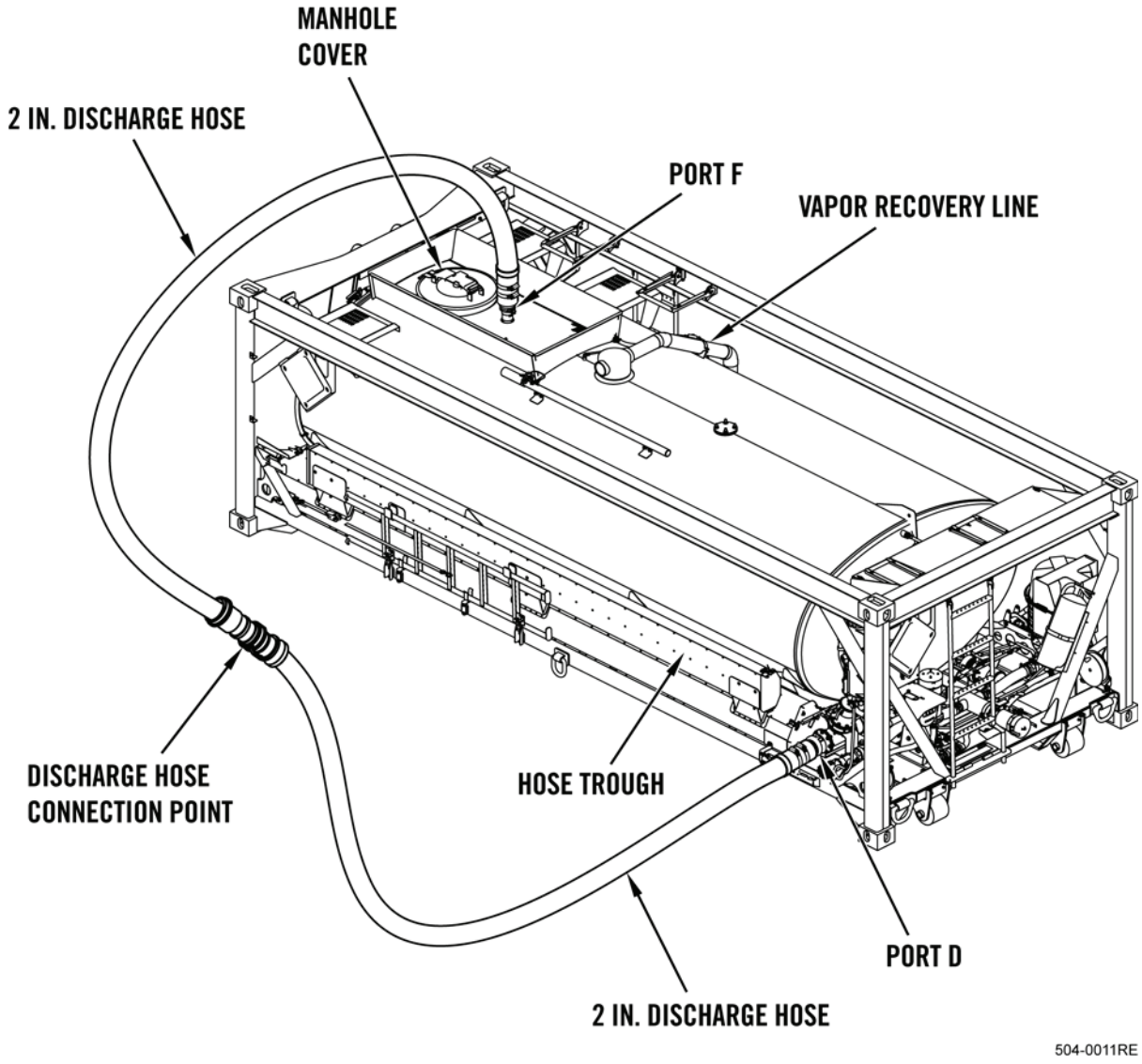


Figure 1. Recirculation Setup.

RECIRCULATE FUEL - CONTINUED

NOTE

Remote control cable and switch operate the same as using fuel pump assembly toggle switch on EMI control box. Remote control cable and switch allows operator to walk up to 40 ft (12.2 m) away from TRM to monitor pumping operations at dispensing point. Remote control switch is not a dead man or momentary-on switch. In order to turn fuel pump assembly on or off, fuel pump assembly toggle switch must be set to desired position.

18. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to ON and set fuel pump assembly control toggle switch (Figure 2, Item 3) on front cover of EMI control box to ON or REMOTE if using remote control switch (Figure 2, item 4).
19. Begin recirculating fuel by use of fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, item 4) and set switch to ON position. Ensure fuel flow meter register starts counting gallons.
20. Perform (DURING) PMCS (WP 0060).

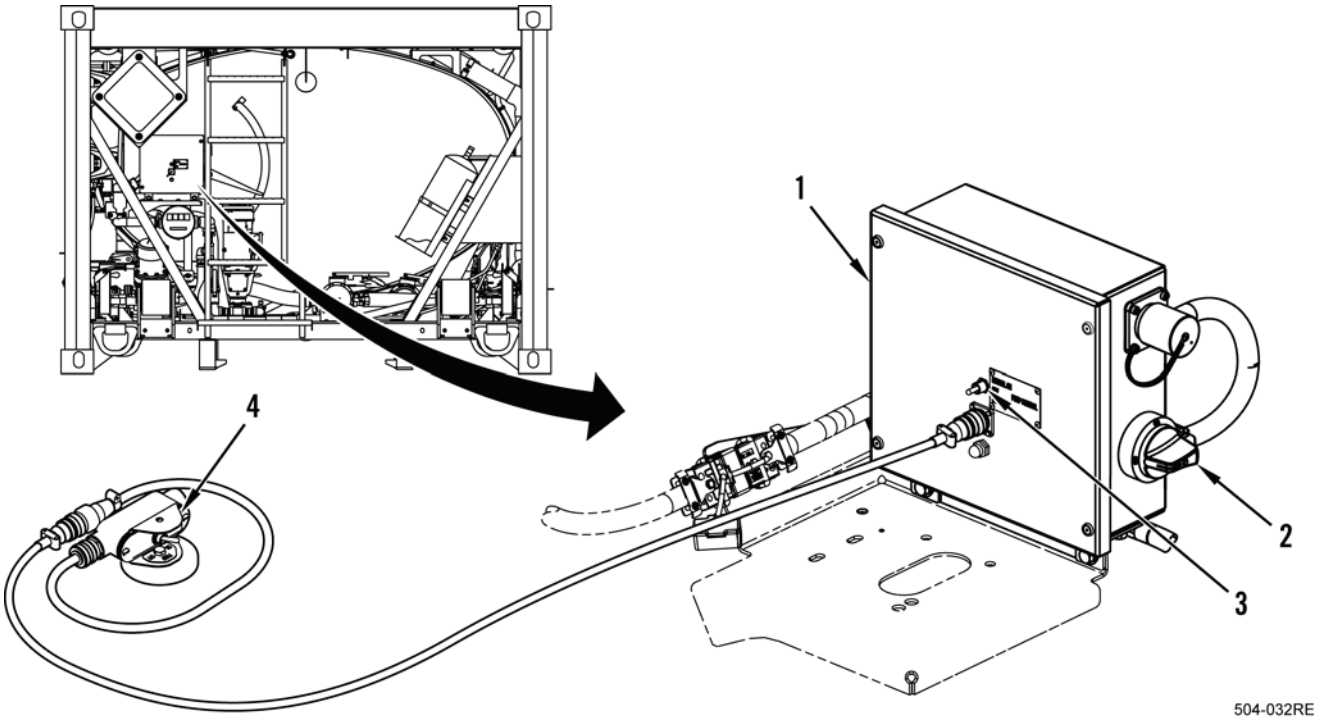


Figure 2. Fuel Pump Assembly Controls.

RECIRCULATE FUEL - CONTINUED

21. Release filter/separator drain hose (Figure 3, Item 4) from holder clip (Figure 3, Item 6) on TRM frame and position drain hose in drip pan.
22. Remove dust plug (Figure 3, Item 5) from drain hose (Figure 3, Item 4).
23. Open V15 valve (Figure 3, Item 3) and drain water from filter/separator (Figure 3, Item 2).
24. Close V15 valve (Figure 3, Item 3) when water has drained from filter/separator sight gauge (Figure 3, Item 1).
25. Install dust plug (Figure 3, Item 5) into drain hose (Figure 3, Item 4).
26. Return drain hose (Figure 3, Item 4) to original position on TRM frame and install in holder clip (Figure 3, Item 6).

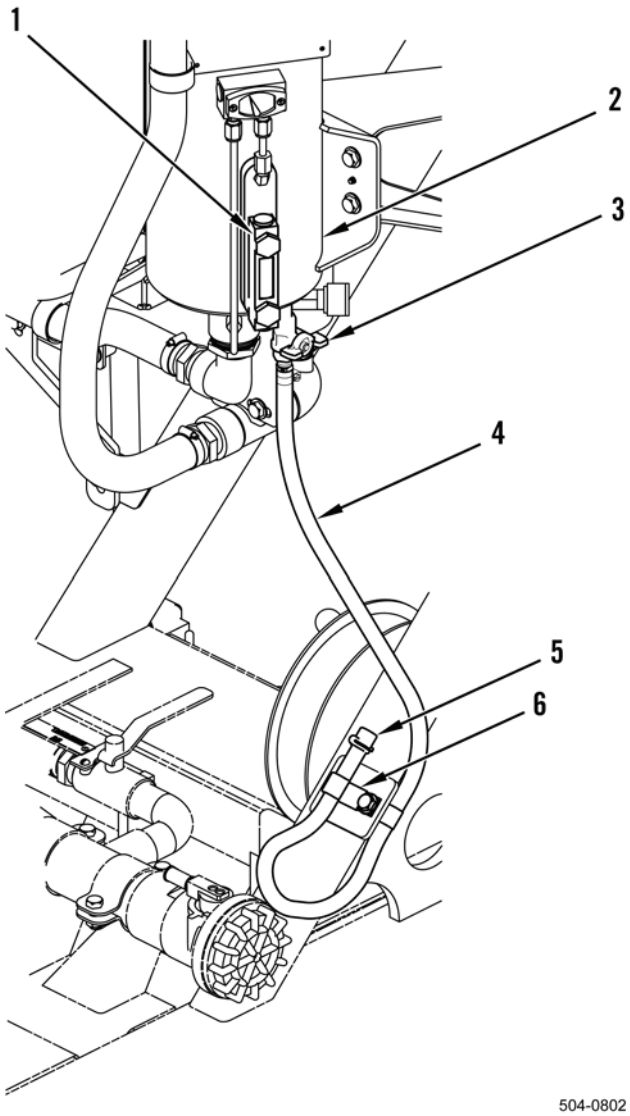


Figure 3. Filter/Separator.

RECIRCULATE FUEL - CONTINUED

27. Set fuel pump assembly toggle switch (Figure 4, Item 3) on front cover of EMI control box (Figure 4, Item 1) to OFF and turn red master switch (Figure 4, Item 2) on side of EMI control box to OFF after completion of fuel recirculation.

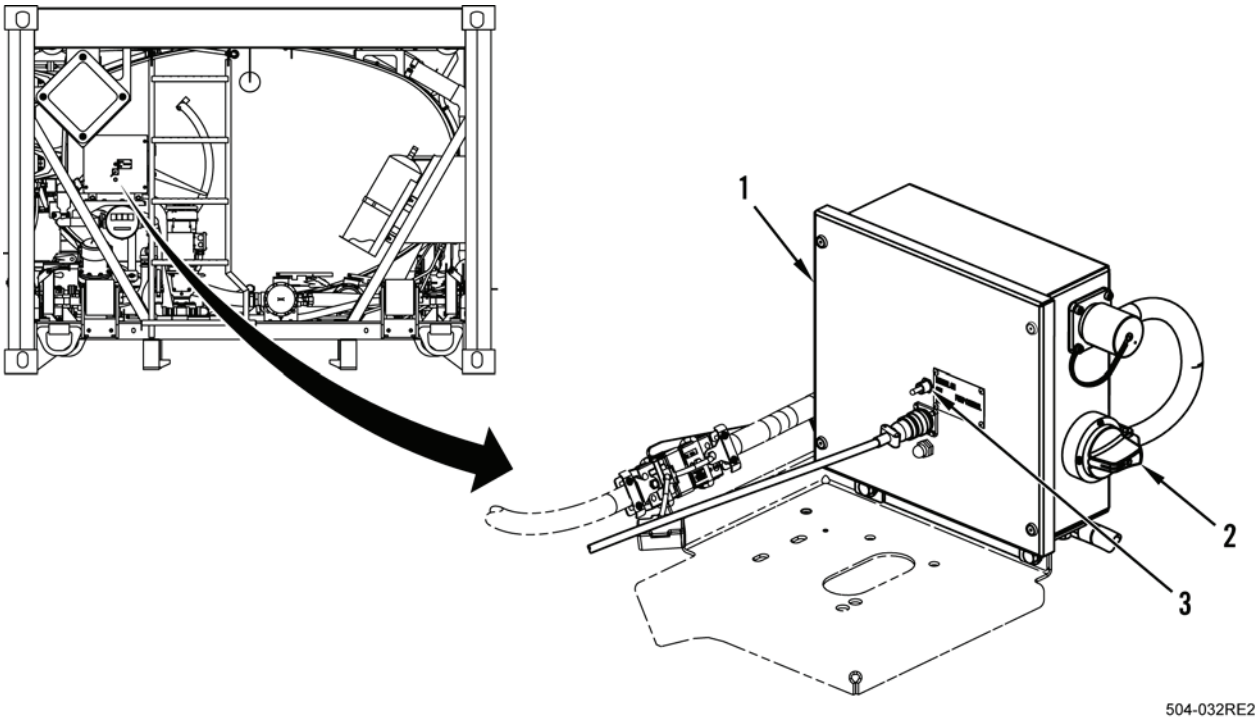


Figure 4. Fuel Pump Assembly Controls.

28. Close unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose at Port F.

NOTE

A second 92F can lift the weight of the 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to help the 92F at Port F disconnect the hose.

29. Pull down on ring on Port F and turn unisex coupling to disconnect discharge hose from Port F.
30. Install dust cap on Port F.
31. Lower 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose carefully to second 92F.
32. Walk 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose end to drip pan.
33. Close V14, V1, V9, and V11 valves.
34. Evacuate hoses (WP 0015).

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
FUEL PUMP ASSEMBLY DISCHARGE PORT D AND PORT E

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Hose, discharge, 2 in. x 13 ft (5.08 cm x 3.96 m) (WP 0066, Table 1, Item 2) Qty: 2
Nozzle assembly (open port) (WP 0066, Table 1, Item 8)

Personnel Required

Two

References

ATP 4-43

References - Continued

FM 10-67-1
WP 0004
WP 0013
WP 0015
WP 0060

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010, WP 0018)
Fuel recirculated (WP 0011)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

NOTE

- The primary method to issue fuel is with the fuel pump assembly. Gravity feeding is an alternate method of issuing fuel (WP 0013).
- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

FUEL PUMP ASSEMBLY DISCHARGE PORT D AND PORT E PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Remove two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses from hose trough on TRM.
5. Remove dust caps and connect a 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to Port D or Port E (Figure 1).
6. Connect dust cap from Port D or E and 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to maintain integrity of seals.
7. Open unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose at port end.
8. Connect the second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to first discharge hose. Open unisex valves.
9. Connect dust caps from two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses to maintain integrity of seals.
10. Remove dust cap, connect open port of nozzle assembly to open end of second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose. Open unisex valves.
11. Connect dust caps from 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose and nozzle assembly to maintain integrity of seals.
12. Open V1 valve (Figure 1) to allow fuel flow from tank to fuel pump assembly.
13. Open V14 valve (Figure 1) to allow fuel flow from fuel pump assembly to filter/separator.
14. Open V9 and V11 valves (Figure 1) if discharging from Port D.
15. Open V8 and V12 valves (Figure 1) if discharging from Port E.

FUEL PUMP ASSEMBLY DISCHARGE PORT D AND PORT E PROCEDURES – CONTINUED

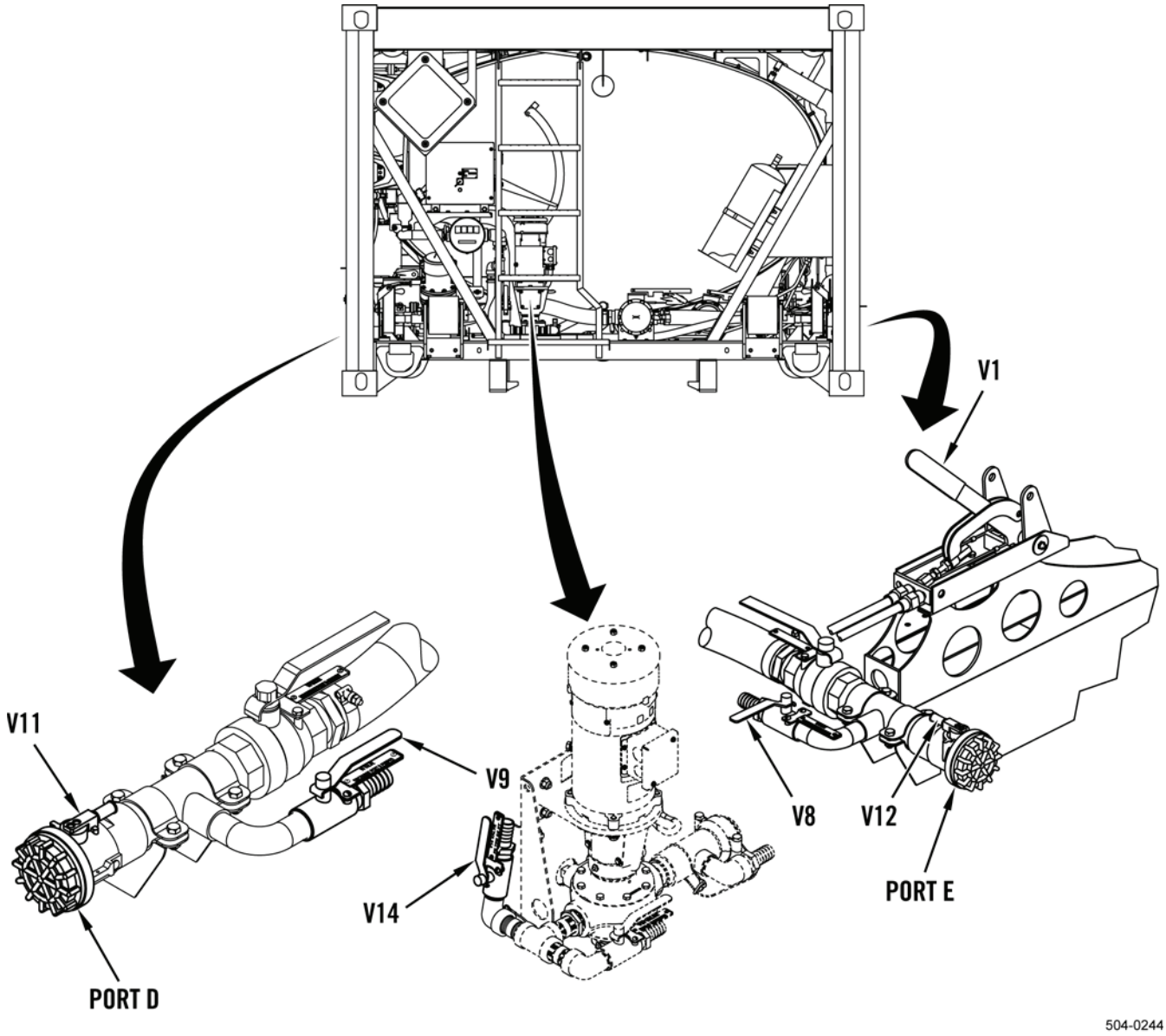


Figure 1. Valve Location, Port D and Port E.

FUEL PUMP ASSEMBLY DISCHARGE PORT D AND PORT E PROCEDURES – CONTINUED

NOTE

Remote control cable and switch operate the same as using fuel pump assembly toggle switch on EMI control box. Remote control cable and switch allows operator to walk up to 40 ft (12.2 m) away from TRM to monitor pumping operations at dispensing point. Remote control switch is not a dead man or momentary-on switch. In order to turn fuel pump assembly on or off, fuel pump assembly toggle switch must be set to desired position (WP 0006).

16. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to ON and set fuel pump assembly control toggle switch (Figure 2, Item 3) on front cover of EMI control box to ON or REMOTE if using remote control switch (Figure 2, item 4).
17. Begin fueling operation by use of fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, item 4) and set switch to ON position. Ensure fuel flow meter starts counting gallons.
18. Perform (DURING) PMCS (WP 0060).
19. Use fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, Item 4) to turn off fuel pump assembly after completion of fuel operations.
20. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to OFF.
21. Close V1 valve (Figure 3).
22. Close V9 and V11 valves (Figure 3) if discharged from Port D.
23. Close V8 and V12 valves (Figure 3) if discharged from Port E.
24. Close V14 valve (Figure 3).

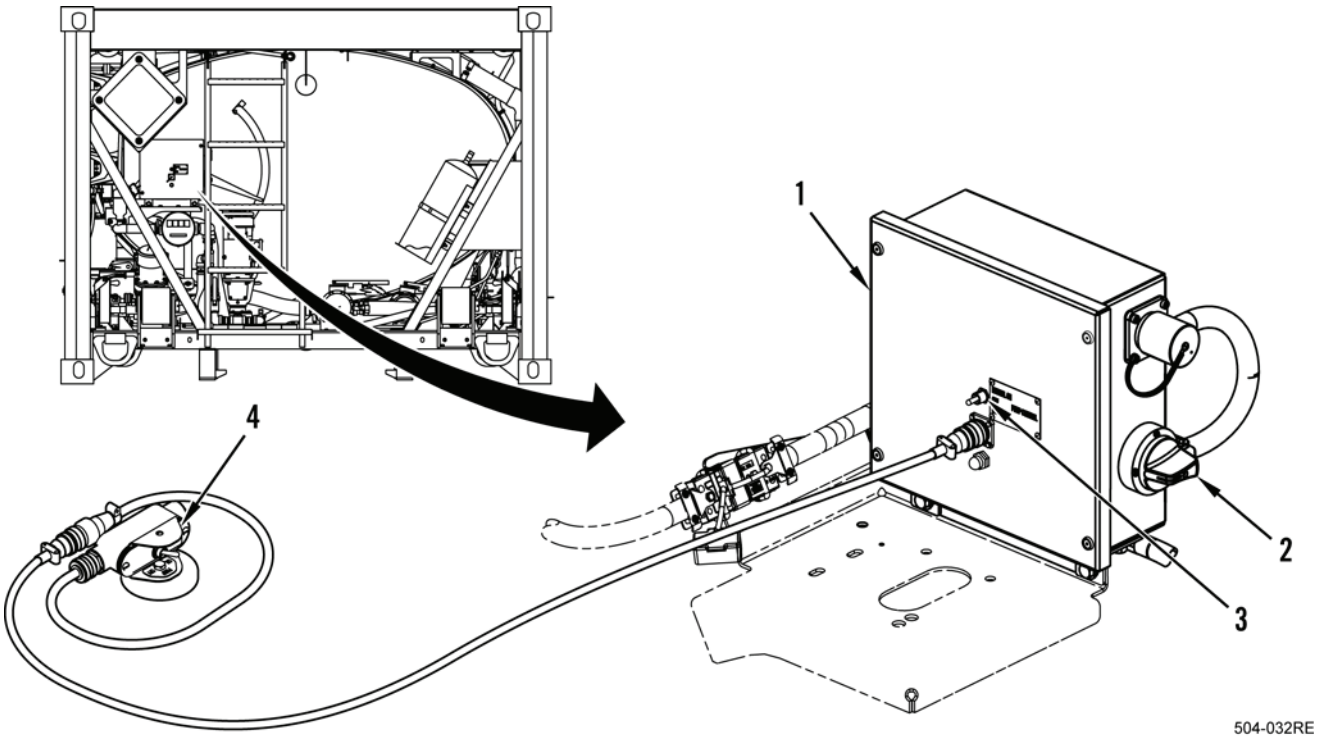


Figure 2. Fuel Pump Assembly Controls.

FUEL PUMP ASSEMBLY DISCHARGE PORT D AND PORT E PROCEDURES – CONTINUED

25. Perform hose evacuation (WP 0015).

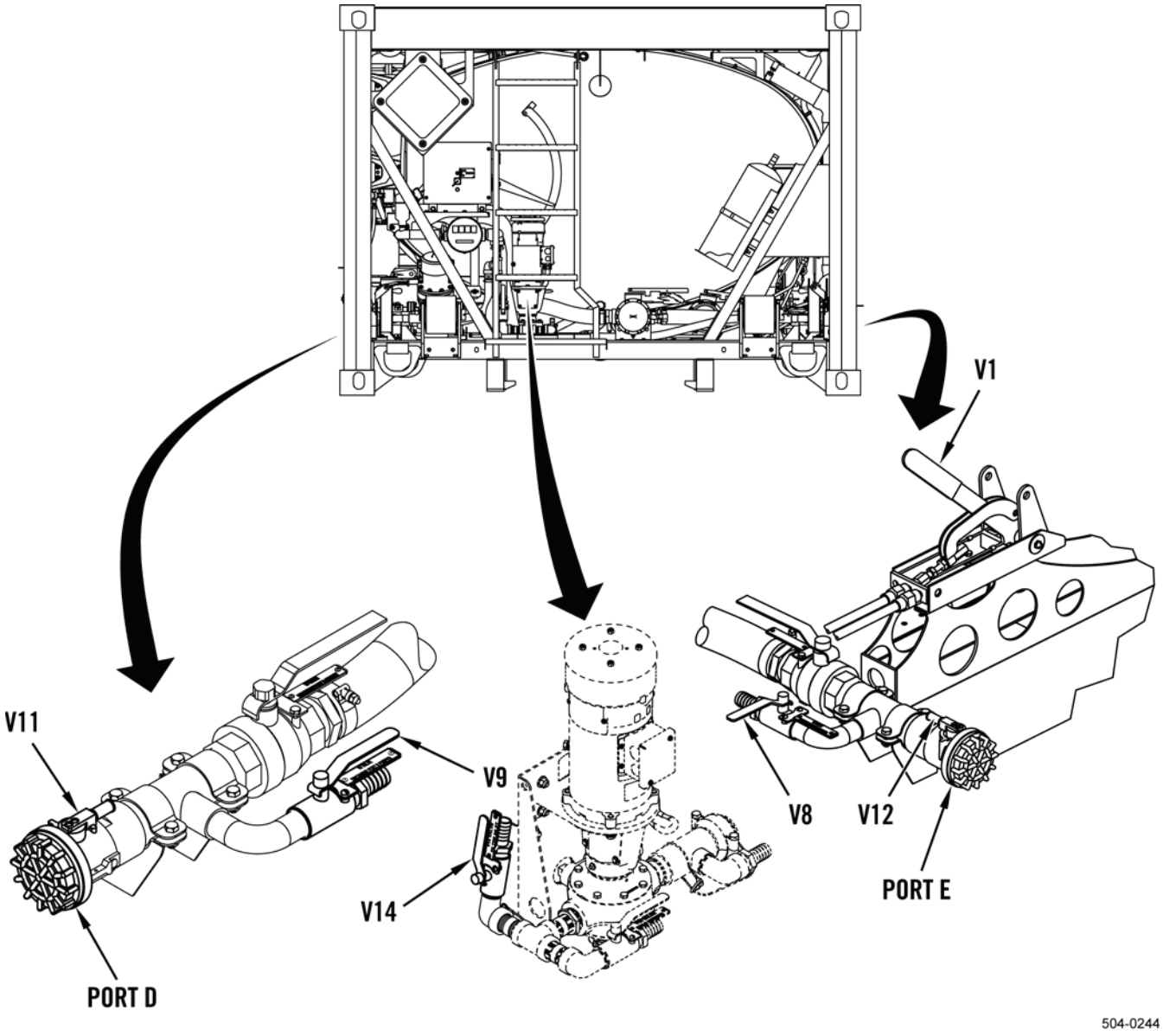


Figure 3. Valve Location, Port D and Port E.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
GRAVITY DISCHARGE PORT D AND PORT E

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Hose, discharge, 2 in. x 13 ft (5.08 cm x 3.96 m) (WP 0066, Table 1, Item 2) Qty: 2
Nozzle assembly (open port) (WP 0066, Table 1, Item 8)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0015

Equipment Condition

TRM prepared for use (WP 0005)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- The primary method to issue fuel is pump discharge. Gravity discharge is an alternate method of issuing fuel.
- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

GRAVITY DISCHARGE PORT D AND PORT E PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Connect a 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to Port D or E (Figure 1).
5. Open unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose.
6. Connect the second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to the first discharge hose.
7. Close unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose.
8. Connect open end of 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose to fuel nozzle.
9. Open V1, V3, and V11 valves (Figure 1) if discharging from Port D.
10. Open V1, V4, and V12 valves (Figure 1) if discharging from Port E.
11. Open remaining unisex valves on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses.
12. Begin gravity discharge through Port D or E (Figure 1).
13. Close V1, V3, and V11 valves (Figure 1) if discharging from Port D.
14. Close V1, V4, and V12 valves (Figure 1) if discharging from Port E.
15. Evacuate 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses (WP 0015) when fueling operations are completed.

GRAVITY DISCHARGE PORT D AND PORT E PROCEDURES – CONTINUED

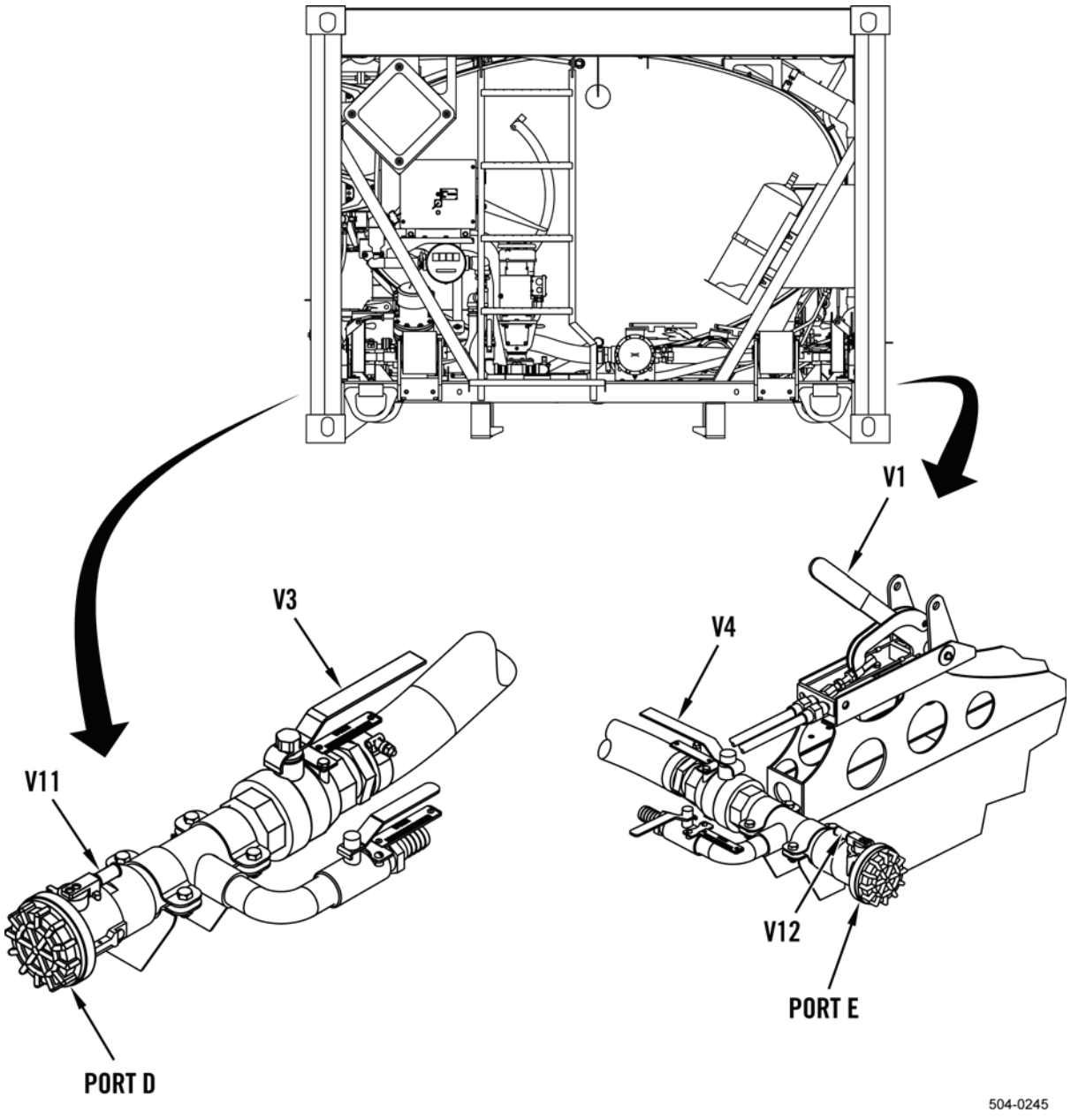


Figure 1. Gravity Discharge Port D and Port E.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
DISCHARGE PORT C
Discharge Procedure, System Evacuation

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010, WP 0018)
Fuel recirculated (WP 0011)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

NOTE

- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, fuel pump assembly controls, and fuel hose connection points.

DISCHARGE PORT C PROCEDURE

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Remove Port C dust cap and connect discharge fuel hose from external transfer pump to Port C (Figure 1).
5. Open V1 valve and V7 valve (Figure 1).
6. Start external transfer fuel pump and begin discharge operation through Port C (Figure 1).
7. Close V1 valve (Figure 1) after loading is complete.
8. Continue to run external fuel pump to evacuate Port C discharge piping.
9. Close V7 valve (Figure 1).
10. Place suitable container under vacuum breaker VB2 valve, and slowly open VB2 valve (Figure 1).
11. Disconnect hose connection carefully at Port C to assist hose evacuation. Verify vacuum is present and close VB2 valve.
12. Lift hose end disconnected from Port C above height of supply source for approximately two minutes to assist in hose evacuation.
13. Close supply source valve and shut off external transfer pump.
14. Discharge residual fuel carefully from 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose into drip pans.
15. Disconnect hose carefully from supply source and discharge any remaining fuel into drip pans.
16. Install dust cap and plugs on hose and Port C.
17. Remove drip pans and containers and dispose of contents per local SOP.

DISCHARGE PORT C PROCEDURE – CONTINUED

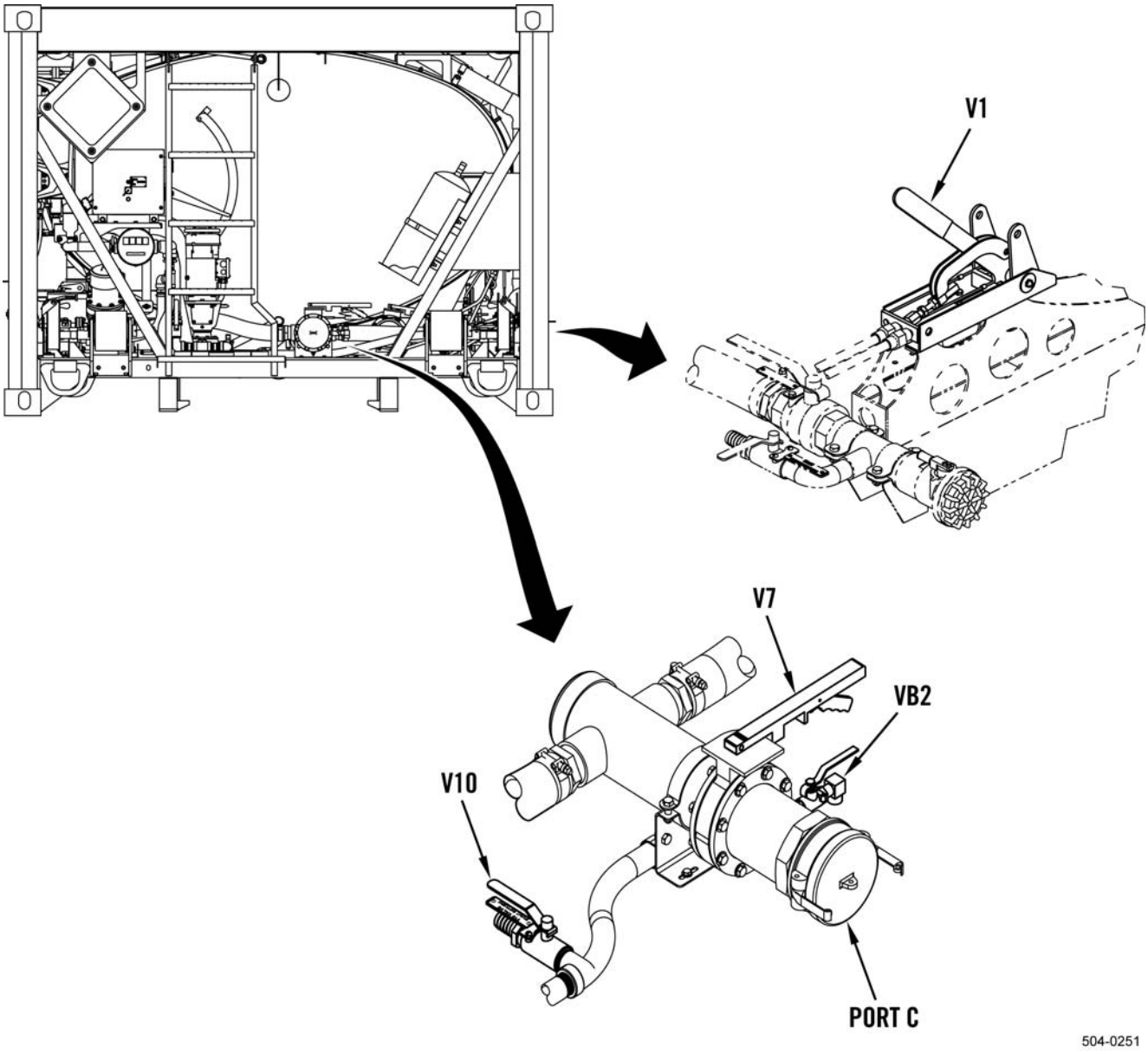


Figure 1. Discharge TRM Port C.

END OF TASK

SYSTEM EVACUATION

1. Place suitable container under VB2 valve (Figure 1).
2. Ensure all valves (V1-V16) are closed.
3. Open V10 and V7 valves (Figure 1).

SYSTEM EVACUATION – CONTINUED

CAUTION

If not pumping fuel, do not run fuel pump assembly for more than 5 minutes. Damage to equipment may occur.

NOTE

Remote control cable and switch operate the same as using fuel pump assembly toggle switch on control box. Remote control cable and switch allows operator to walk up to 40 ft (12.2 m) away from TRM to monitor pumping operations at dispensing point. Remote control switch is not a dead man or momentary-on switch. In order to turn fuel pump assembly on or off, fuel pump assembly toggle switch must be set to desired position.

4. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to ON and set fuel pump assembly control toggle switch (Figure 2, Item 3) on front cover of EMI control box to ON or REMOTE if using remote control switch (Figure 2, item 4).
5. Begin evacuating fuel by use of fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, item 4) and set switch to ON position.

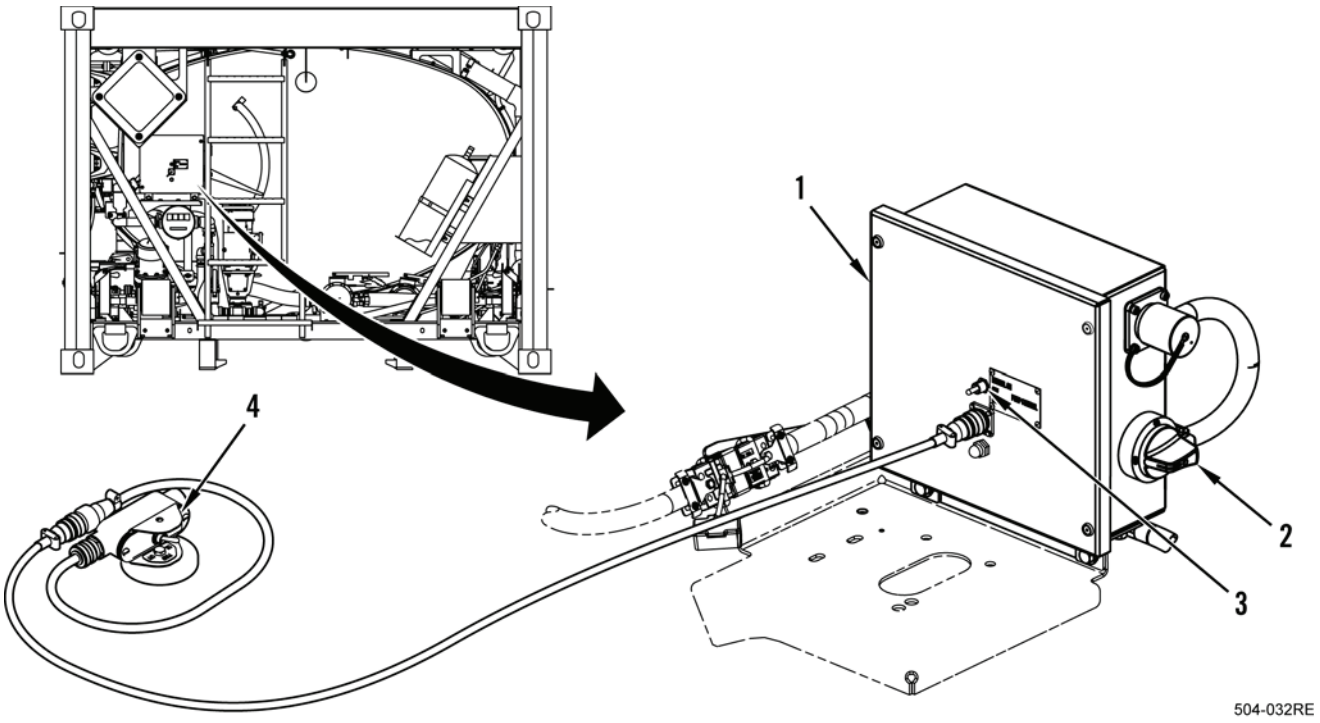


Figure 2. Fuel Pump Assembly Controls.

6. Open VB2 valve (Figure 3) slowly until air suction is heard for approximately 5 seconds.
7. Close VB2 valve.
8. Close V7 valve (Figure 3).
9. Open V3 and V4 valves (Figure 3) for 30 seconds.
10. Close V3 and V4 valves.

SYSTEM EVACUATION – CONTINUED

11. Open V8 and V9 valves (Figure 3) for 10 seconds.
12. Close V8 and V9 valves.
13. Use fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, Item 4) to turn off fuel pump assembly after completion of evacuation operations.
14. Close V10 valve (Figure 3).
15. Disconnect power from TRM (WP 0006).
16. Install dust cap on bottom of vapor recovery line and close manhole cover.

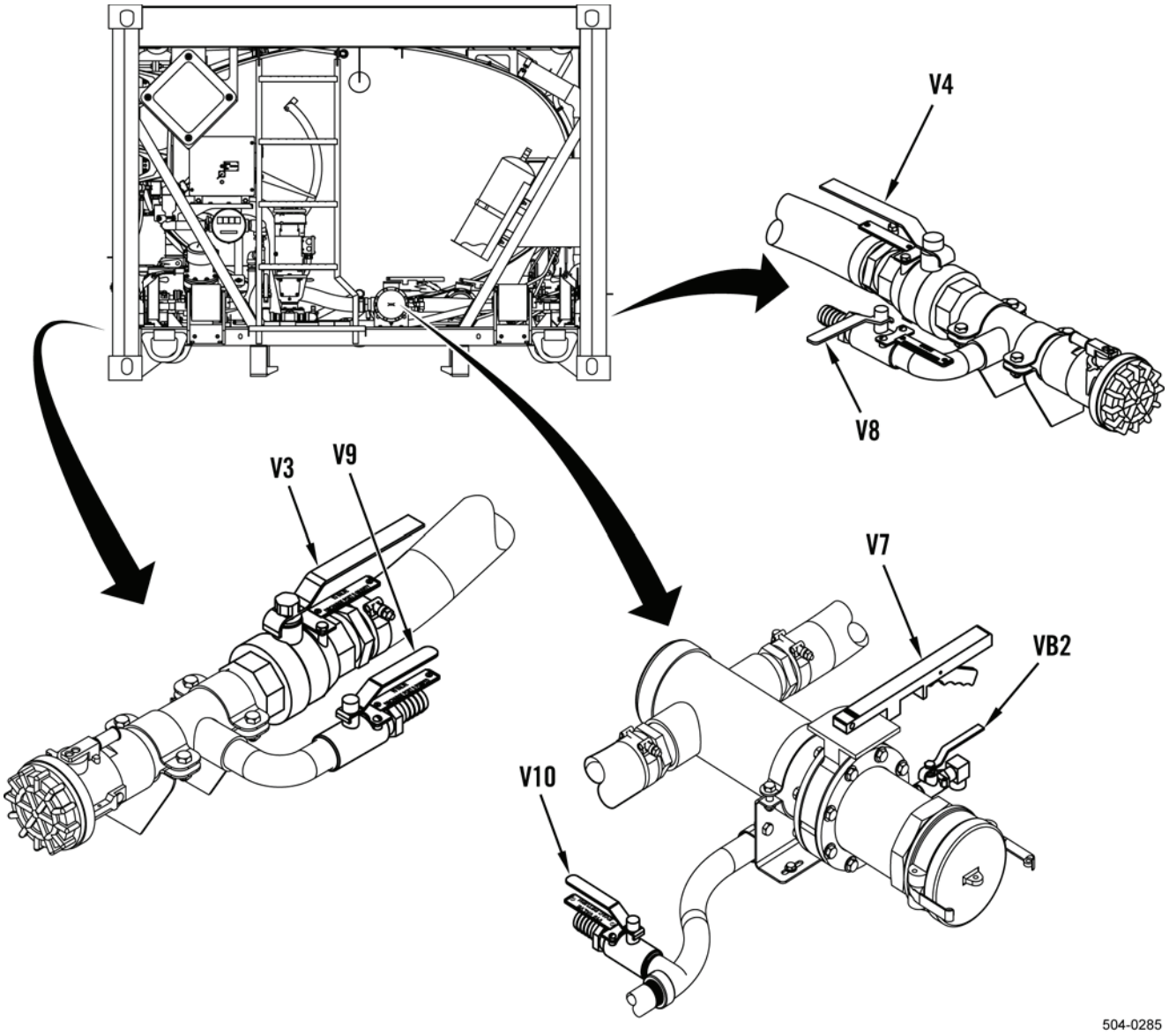


Figure 3. System Evacuation.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
HOSE EVACUATION PORT D AND PORT E

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

NOTE

- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and other TRM components.

HOSE EVACUATION PORT D AND PORT E PROCEDURES

1. Open V10, V3, and V11 valves (Figure 1) if evacuating Port D.
2. Open V10, V4, and V12 valves (Figure 1) if evacuating Port E.

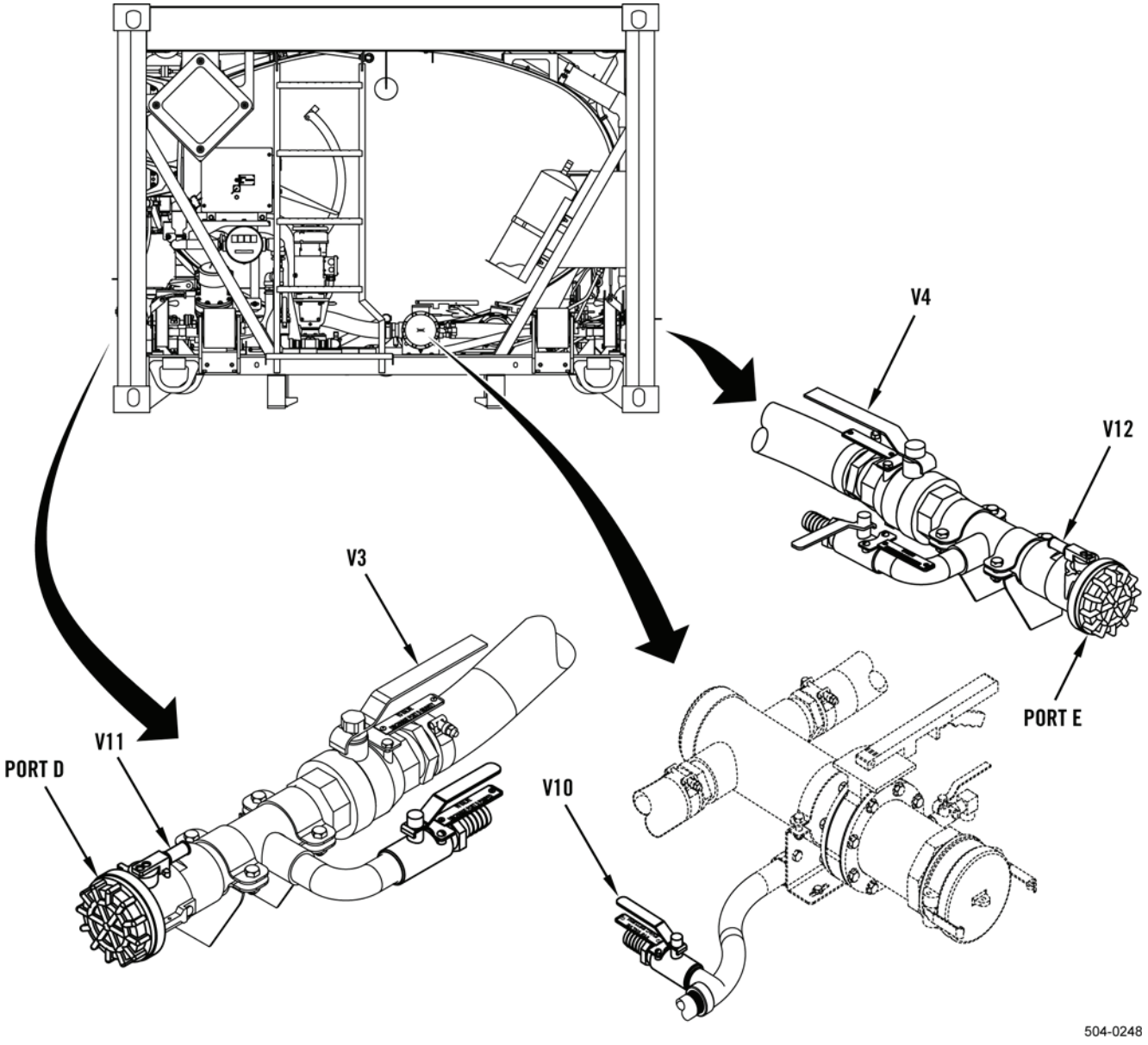


Figure 1. Hose Evacuation Port D and Port E.

HOSE EVACUATION PORT D AND PORT E PROCEDURES – CONTINUED

CAUTION

If not pumping fuel, do not run fuel pump assembly for more than 5 minutes. Damage to equipment may occur.

NOTE

Remote control cable and switch operate the same as using fuel pump assembly toggle switch on control box. Remote control cable and switch allows operator to walk up to 40 ft (12.2 m) away from TRM to monitor pumping operations at dispensing point. Remote control switch is not a dead man or momentary-on switch. In order to turn fuel pump assembly on or off, fuel pump assembly toggle switch must be set to desired position.

3. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to ON and set fuel pump assembly control toggle switch (Figure 2, Item 3) on front cover of EMI control box to ON or REMOTE if using remote control switch (Figure 2, item 4).
4. Use fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, item 4) and set switch to ON position to begin evacuation operations.

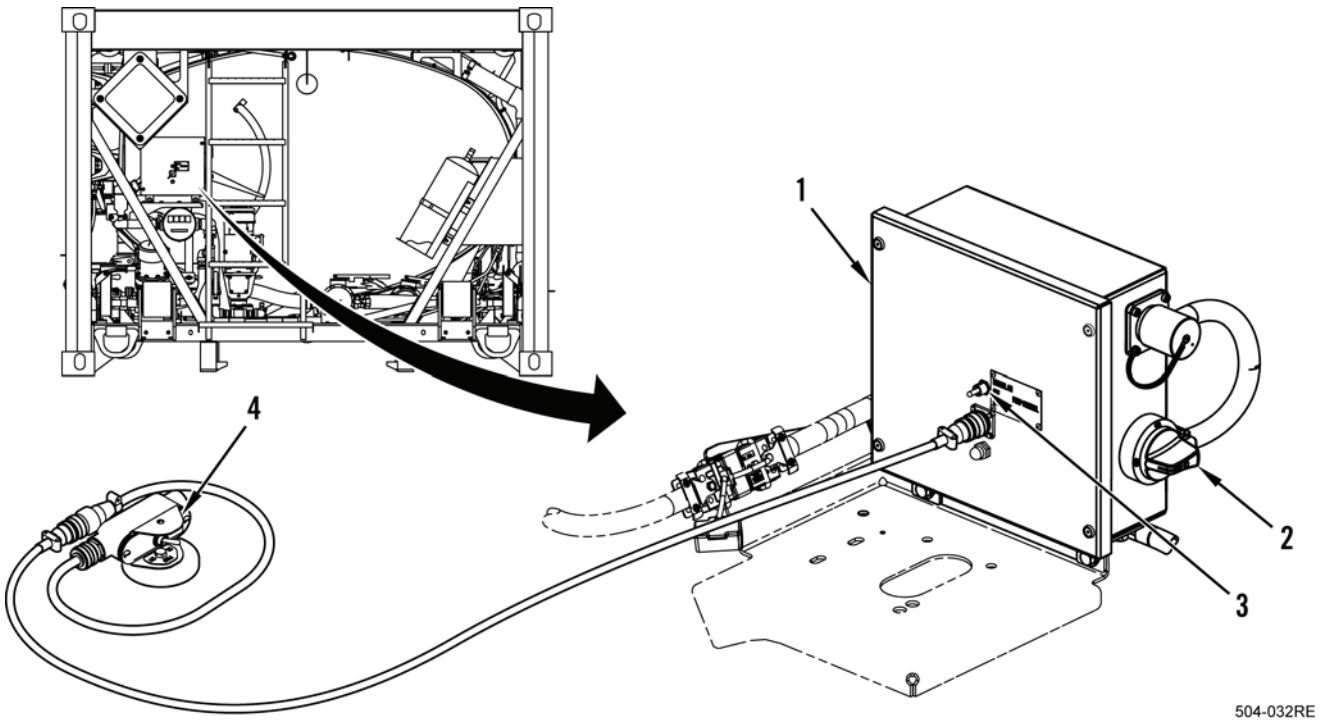


Figure 2. Fuel Pump Assembly Controls.

HOSE EVACUATION PORT D AND PORT E PROCEDURES – CONTINUED

NOTE

- To aid in evacuation of 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses, hold unisex valve on hose or nozzle assembly (if attached) above level of fuel pump assembly.
- To evacuate each 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose, let fuel pump assembly run for a minimum of 10 minutes.

5. Open and close unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose or nozzle assembly (if attached) to create back pressure.
6. Keep unisex valve on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose or nozzle assembly (if attached) above the height of Port D or Port E and open all unisex valves to evacuate fuel from discharge hoses.
7. Place drip pan on ground near discharge hoses.
8. Walk first 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose toward second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose.
9. Close unisex valves between nozzle assembly and first 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose (if nozzle assembly attached), disconnect nozzle assembly from 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose, and install dust caps.
10. Close both unisex valves at discharge hose connection point and disconnect 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses.
11. Open unisex valve, drain residual fuel from first 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose into drip pan, close unisex valve, and install dust cap.
12. Walk second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose toward Port D or Port E.

NOTE

- To aid in evacuation of 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses, hold unisex valve on hose or nozzle assembly (if attached) above level of fuel pump assembly.
- To evacuate each 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose, let fuel pump assembly run for a minimum of 10 minutes.

13. Open and close unisex valve on second discharge hose to create back pressure.
14. Close Port D V11 valve or Port E V12 valve.
15. Close unisex valve on discharge hose at Port D or Port E and disconnect discharge hose from Port D or Port E.
16. Open unisex valve, drain residual fuel from second 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose into drip pan, close unisex valves, and install dust caps on 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose.
17. Close Port D valves V3 and V10 and/or Port E valves V4 and V10.
18. Use fuel pump assembly control toggle switch or remote control switch to turn off fuel pump assembly after completion of discharge hose evacuation.
19. Install dust cap on bottom of vapor recovery line and close manhole cover.
20. Stow two 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hoses.
21. Remove drip pan and dispose of contents per local SOP.
22. Disconnect power from TRM (WP 0006).

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
HOSE EVACUATION THROUGH PORT C AFTER USING NATO ADAPTER

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply could result in injury or death to personnel.

NOTE

- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

HOSE EVACUATION THROUGH PORT C AFTER USING NATO ADAPTER PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Remove cap from Port C and plug from camlock adapter and connect to Port C (Figure 1). Connect dust caps and plugs to maintain integrity of seals
5. Open camlock adapter valve (Figure 1).
6. Open V7 valve and V10 valve (Figure 1).

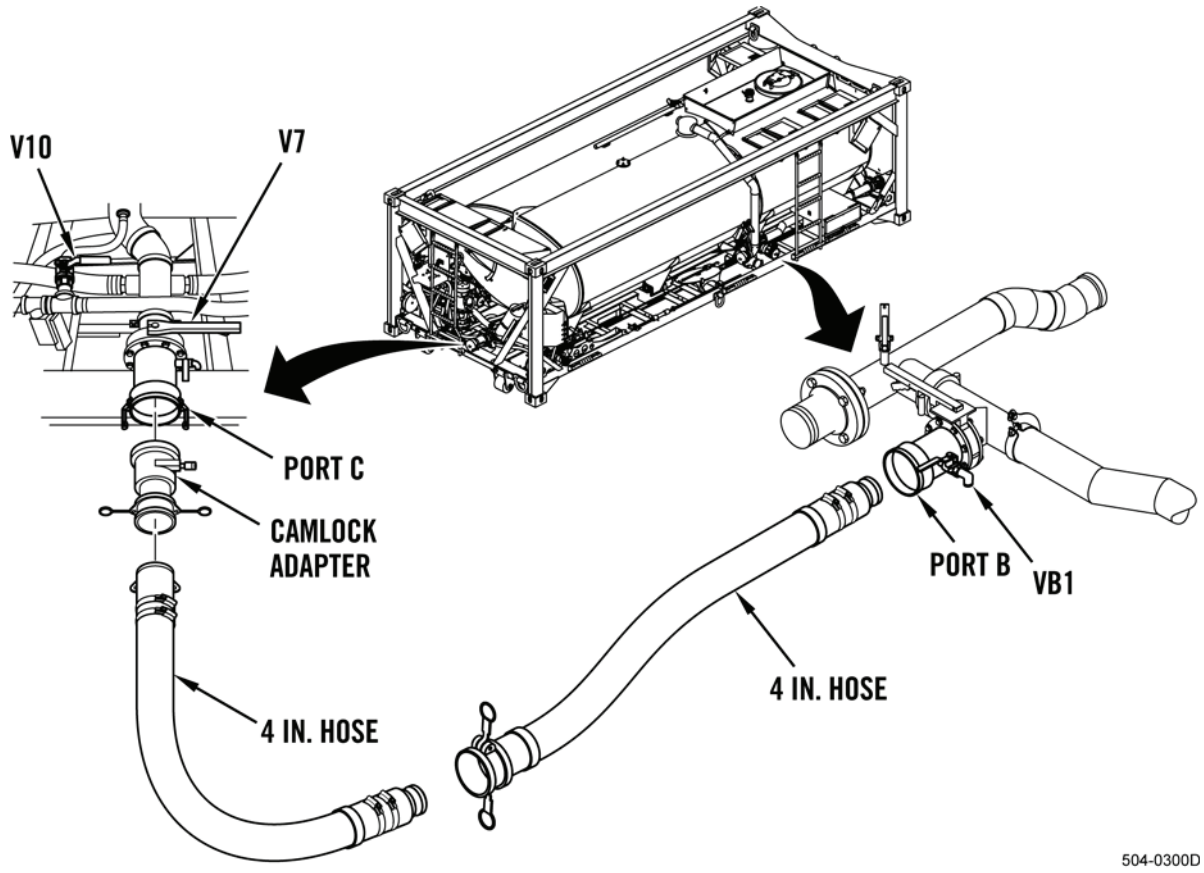


Figure 1. Hose Evacuation Through Port C After Using NATO Adapter.

HOSE EVACUATION THROUGH PORT C AFTER USING NATO ADAPTER PROCEDURES – CONTINUED

CAUTION

If not pumping fuel, do not run fuel pump assembly for more than 5 minutes. Damage to equipment may occur.

NOTE

Remote control cable and switch operate the same as using fuel pump assembly toggle switch on control box. Remote control cable and switch allows operator to walk up to 40 ft (12.2 m) away from TRM to monitor pumping operations at dispensing point. Remote control switch is not a dead man or momentary-on switch. In order to turn fuel pump assembly on or off, fuel pump assembly toggle switch must be set to desired position.

7. Turn red master switch (Figure 2, Item 2) on side of EMI control box (Figure 2, Item 1) to ON and set fuel pump assembly control toggle switch (Figure 2, Item 3) on front cover of EMI control box to ON or REMOTE if using remote control switch (Figure 2, item 4).
8. Begin evacuation operations by use of fuel pump assembly control toggle switch (Figure 2, Item 3) or remote control switch (Figure 2, item 4) and set switch to ON position.
9. Place suitable container under vacuum breaker VB1 valve and slowly open VB1 valve (Figure 1). Verify vacuum is present for 30 seconds. Close VB1 valve.
10. Allow fuel system to evacuate for 5 minutes.
11. Disconnect 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose carefully from port B and install plug in port B (Figure 1).
12. Install cap on 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose end disconnected from Port B and lift above height of fuel pump assembly for approximately 2 minutes to assist in hose evacuation. Walk first 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose toward second 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose.
13. Disconnect first 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose from second 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose and drain residual fuel from first suction hose. Install plug in first suction hose and dust cap on second suction hose (Figure 1).

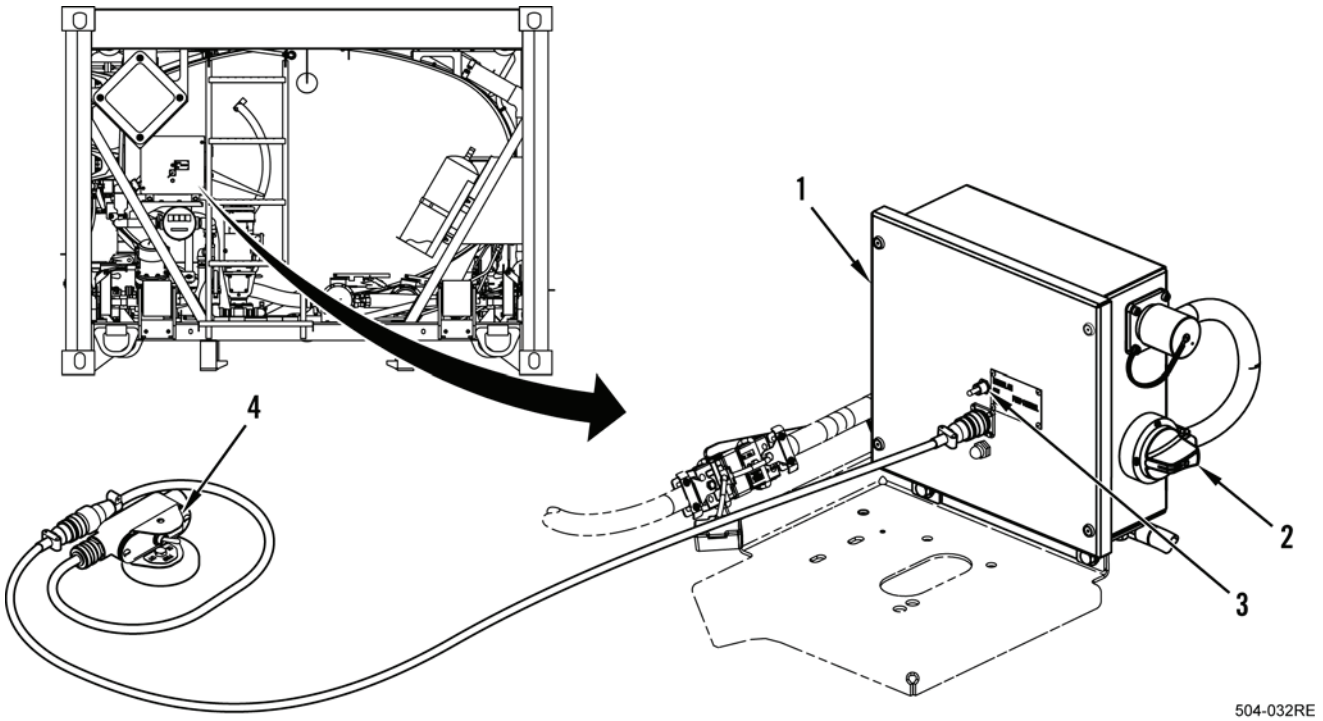


Figure 2. Fuel Pump Assembly Controls.

HOSE EVACUATION THROUGH PORT C AFTER USING NATO ADAPTER PROCEDURES – CONTINUED

14. Lift second 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose above height of fuel pump assembly for approximately 2 minutes to assist in hose evacuation. Walk second suction hose toward Port C.
15. Close camlock adapter valve, V7 valve, and V10 valve (Figure 3).
16. Use fuel pump assembly control toggle switch (Figure 2, Item 2) or remote control switch (Figure 2, Item 3) to turn off fuel pump assembly.
17. Disconnect second 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose carefully from camlock adaptor (Figure 3) and drain residual fuel. Install plug in 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose (Figure 3).
18. Open camlock adapter valve slowly and drain residual fuel from camlock adapter (Figure 3).
19. Disconnect camlock adapter carefully from Port C, drain residual fuel, and plug and cap camlock adapter (Figure 3).
20. Install cap on Port C (Figure 3).
21. Install dust cap on bottom of vapor recovery line and close manhole cover.
22. Remove drip pans and containers and dispose of contents per local SOP.
23. Stow two 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses.
24. Disconnect power from TRM (WP 0006).

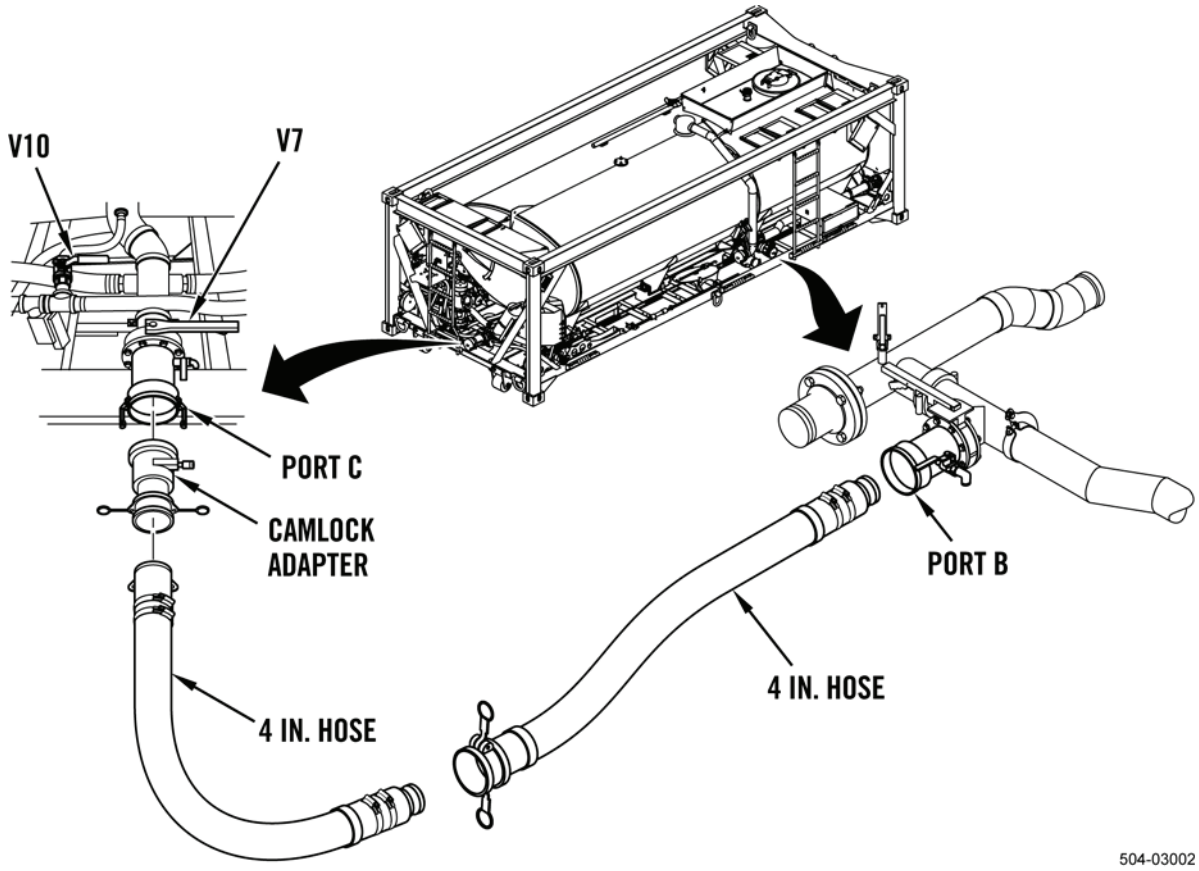


Figure 3. Hose Evacuation Through Port C After Using NATO Adapter.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
UPLOAD AND DOWNLOAD TRM

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
TM 9-2320-319-10-1
TM 9-2320-319-10-2
TM 9-2320-345-10
TM 9-2320-364-10
TM 9-2320-424-10
TM 9-2330-342-10
TM 9-2330-385-10
WP 0023

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Know load limits of your lift before attempting to lift TRM. Keep personnel at least 6 ft (2 m) away from TRM being raised.
- Failure to comply could result in injury or death to personnel.

CAUTION

- Prior to uploading or downloading the TRM onto or off the PLS trailer, the roller assemblies of the TRM must be in the emplacement position (WP 0023). This will prevent damage to TRM frame.
- Ensure TRM is not being placed on parts which might be damaged. Lower TRM and readjust lift before continuing further if contact with equipment is not even or if it looks as if TRM may slip. Failure to comply could result in damage to equipment.

UPLOAD AND DOWNLOAD TRM

Refer to TM 9-2320-364-10, *Operator's Manual for Truck, Tractor, M1074 and M1075 Palletized Load System (PLS)*, for procedures to upload and download TRM from PLS.

Refer to TM 9-2320-319-10-1 and TM 9-2320-319-10-2, *Operator's Manual, for Truck Tractor, M1074A1 and M1075A1 PLS,* for procedures to upload and download TRM from PLS.

Refer to TM 9-2330-385-10, *Operator's Manual for Palletized Load System Trailer (PLST), M1076*, for procedures to upload and download TRM from PLS.

Refer to TM 9-2330-342-10, *Operator's Manual for PLST, M1076A1*, for procedures to upload and download TRM from PLS.

Refer to TM 9-2320-424-10, *Operator's Manual for Load Handling System (LHS), M1120A2*, for procedures to upload and download from LHS.

Refer to TM 9-2320-345-10, *Operator's Manual for LHS, with and without Winch, 8 x 8, M1120A4*, for procedures to upload and download from LHS.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
HEMTT INTERFACE

Longitudinal Transfer Using Vehicle Pump (TRM to HEMTT), Longitudinal Transfer Using Vehicle Pump (HEMTT to TRM), Transverse Transfer Using Vehicle Pump (TRM to HEMTT), Transverse Transfer Using Vehicle Pump (HEMTT to TRM)

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Flange adapter assembly (D1) (WP 0066, Table 1, Item 12)
Hose, discharge, 4 in. x 8 ft (10.16 cm x 2.4 m) (WP 0066, Table 1, Item 4)
Hose, discharge, 4 in. x 6 ft (10.16 cm x 1.83 m) (WP 0066, Table 1, Item 5)
Hose, discharge, 3 in. x 3.5 ft (7.6 cm x 1.1 m) (WP 0066, Table 1, Item 10)
Hose, discharge, 4 in. x 15 ft (10.16 cm x 4.6 m) (WP 0066, Table 1, Item 3)

Materials/Parts - Continued

Reducer, quick-disconnect, 3 to 4 in. (7.62 cm to 10.16 cm) (WP 0066, Table 1, Item 11)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
TM 9-2320-325-14&P
TM 9-2320-339-10
TM 9-2320-348-10
TM 9-2320-429-10
WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM mounted on PLS trailer (WP 0017)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of connection points, ports, and valves.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT)

Set Up

NOTE

- TRM to HEMTT transfer is not a defuel mission.
- Operation procedures below are typical. References are to TM 9-2320-429-10. Use TMs in References list in INITIAL SETUP for HEMTT tanker being used for fueling operations.
- Position HEMTT approximately 7 ft (2 m) from TRM.
- Refer to Figures 1 and 2.

1. Close all valves on HEMTT and TRM (V1-V16).
2. Open manhole cover on HEMTT.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

3. Push down on manhole cover on TRM, release latch, and slowly open manhole cover to gradually release any pressure.
4. Connect 4 in. x 8 ft (10.16 cm x 2.4 m) suction hose to HEMTT and TRM.
   a. Connect hose to HEMTT Port B gravity receptacle (Figure 1, Item 5).
   b. Remove port G dust cap and connect hose to TRM port G.

WARNING

Ensure valve on flange adapter assembly (D1) is closed until given direction to open to prevent injury or death to personnel.

5. Connect 3 in. x 3.5 ft (7.6 cm x 1.1 m) suction hose (straight end) to HEMTT Port C (Figure 1, Item 3) bulk receptacle.
6. Connect flange adapter assembly (D1) to HEMTT Port A (Figure 1, Item 1) receptacle (bottom load inlet).
7. Connect 3 in. x 3.5 ft (7.6 cm x 1.1 m) suction hose (elbow end) to flange adapter assembly (D1).
8. Open TRM V2 valve.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Set Up - Continued

9. Open TRM V13 valve (Port G).
10. Position lever on flange adapter assembly (D1) to OPEN position.
11. Open V17 valve (Figure 1, Item 4) on HEMTT.
12. Open V18 valve (Figure 1, Item 2) on HEMTT.

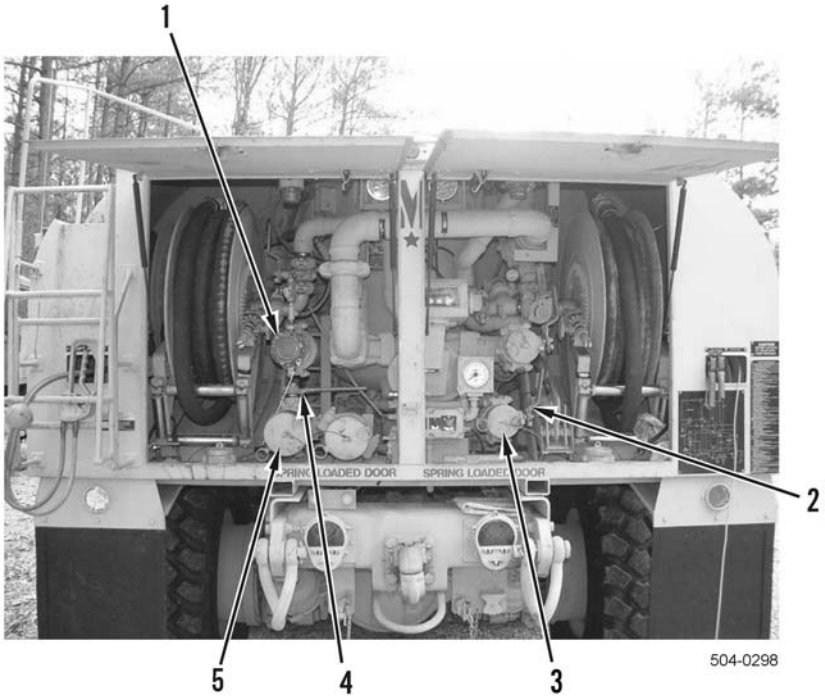


Figure 1. HEMTT Setup.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Set Up - Continued

13. Start fuel transfer in accordance with TM 9-2320-429-10 and as follows:
    a. Start HEMTT and engage PTO.
    b. Push PUMP ENGAGEMENT LEVER (Figure 2, Item 4) on the HEMTT forward.
    c. Set TC/THROTTLE CONTROL switch (Figure 2, Item 3) up to ON position.
    d. Pull out HAV HAND ACTUATED CONTROL valve (Figure 2, Item 1).

NOTE

HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

    e. Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve (Figure 2, Item 1).
    f. Press HI/HIGH IDLE switch (Figure 2, Item 2).

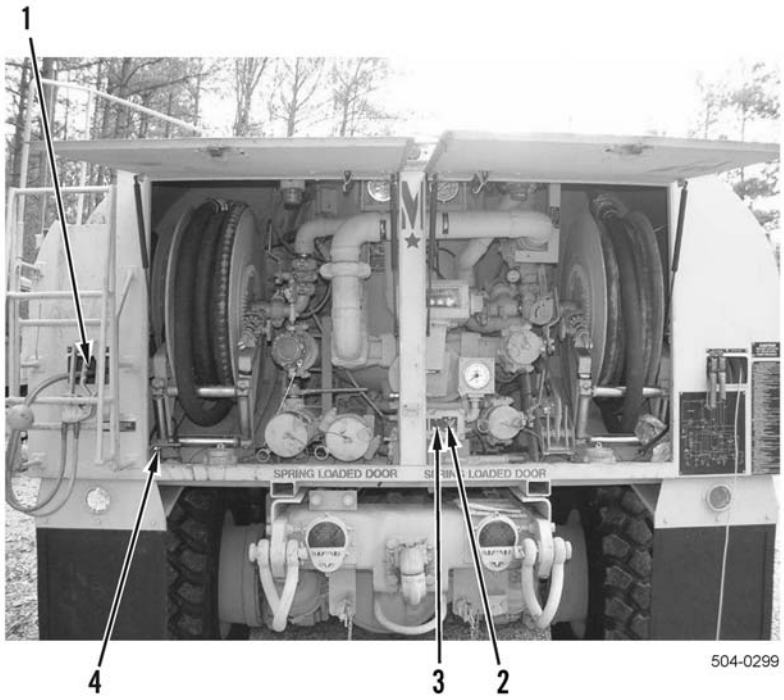
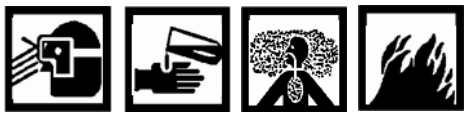


Figure 2. HEMTT Operation.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down

WARNING



Continue to squeeze and hold the HAV HAND ACTUATED CONTROL valve until hose evacuation is complete (V17 valve is closed). Failure to do so will result in equipment damage and personal injury.

1. Close V2 valve on TRM and open V6 valve (Figure 3, Item 1) on TRM when fuel transfer is complete.
2. Operate HEMTT pump for approximately 2 minutes to evacuate fuel from TRM lower piping.
3. Close V13 valve (Port G) on TRM and continue to operate HEMTT pump for approximately 1 minute to evacuate fuel from 4 in. x 8 ft (10.16 cm x 2.4 m) suction hose.
4. Disconnect hose connection carefully at Port G on TRM to assist in hose evacuation process.
5. Verify vacuum is present.

Figure 3. V6 Valve on TRM.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down - Continued

6. Lift 4 in. x 8 ft (10.16 cm x 2.43 m) suction hose connection at TRM and elevate above B Gravity Port (Figure 4, Item 5) on HEMTT in order to assist in hose evacuation process.
7. Reinstall dust cap on TRM Port G and install cap on 4 in. x 8 ft (10.16 cm x 2.43 m) suction hose.
8. Close V17 valve (Figure 4, Item 4) (Port B) at HEMTT and disengage HIGH IDLE.
9. Stop HEMTT pump in accordance with TM 9-2320-429-10 and as follows:
   a. Release HAV HAND ACTUATED CONTROL valve lever (Figure 4, Item 7).
   b. Pull back on PUMP ENGAGEMENT LEVER (Figure 4, Item 6) until locked.

CAUTION

Carefully guide HAV HAND ACTUATED CONTROL valve hoses through access hole onto reel. Failure to comply may result in damage to equipment.

   c. Rewind HAV HAND ACTUATED CONTROL valve (Figure 4, Item 7) hoses onto reel.
10. Disconnect 4 in. x 8 ft (10.16 cm x 2.43 m) suction hose from Port B (Figure 4, Item 5) on HEMTT.
11. Position high end of 4 in. x 8 ft (10.16 cm x 2.43 m) suction hose over drip pan and discharge residual fuel in a controlled manner.

CAUTION

Hose connection in the following steps will contain fuel. Use care to discharge excess fuel into drip pans and avoid contact.

12. Close V18 valve (Figure 4, Item 2) on HEMTT.
13. Close D1 valve lever on D1 nozzle.
14. Disconnect D1 nozzle carefully from Port A (Figure 4, Item 1) on HEMTT.
15. Lower D1 end of hose below height of Port C (Figure 4, Item 3).
16. Disconnect connection carefully at Port C (Figure 4, Item 3) on HEMTT and drain remaining fuel into suitable container or drip pan.
17. Disassemble the 3 in. x 3.5 ft (7.6 cm x 1.06 m) hose assembly and stow all hoses.
18. Close manhole covers on HEMTT and TRM.
19. Remove drip pan and dispose of contents per local SOP.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down - Continued

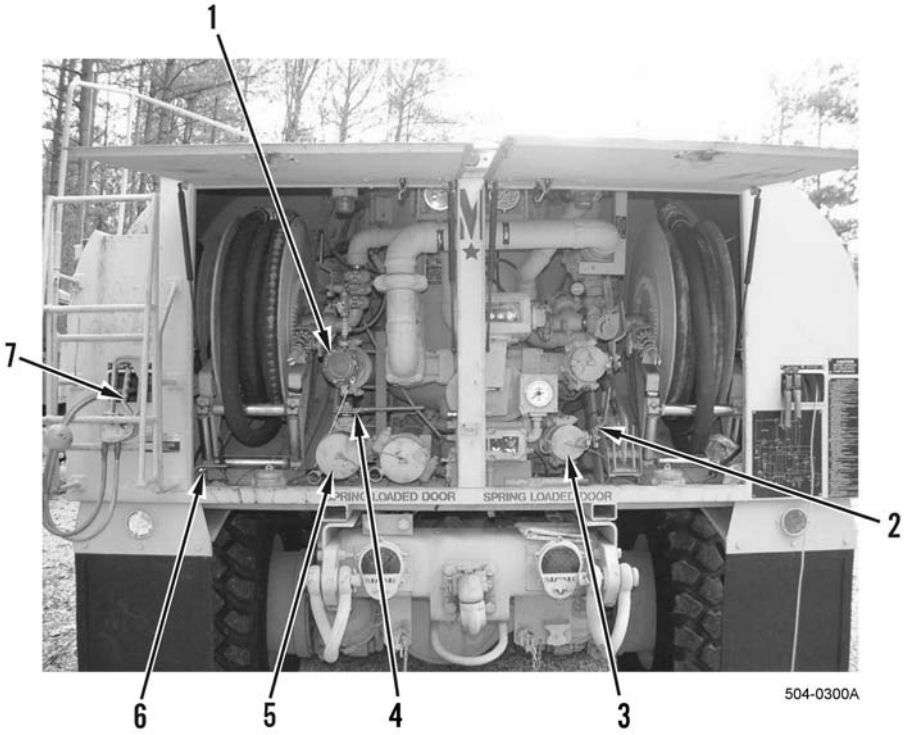


Figure 4. HEMTT Take Down.

END OF TASK

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM)

Set Up

NOTE

- Operation procedures below are typical. References are to TM 9-2320-429-10. Use TMs in References list in INITIAL SETUP for HEMTT tanker being used for fueling operations.
- Position HEMTT approximately 7 ft (2.13 m) from TRM.

1. Close all valves on HEMTT and TRM (V1-V16).
2. Open manhole cover on HEMTT.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Set Up - Continued

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

3. Push down on manhole cover on TRM, release latch, and slowly open manhole cover to gradually release any pressure.
4. Connect 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer to Port D (Figure 5, Item 1) on HEMTT.
5. Connect 4 in. x 6 ft (10.16 cm x 1.83 m) suction hose to HEMTT and TRM as follows:
   a. Connect hose to 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer at Port D on HEMTT.
   b. Connect hose to TRM port G.
6. Open TRM V13 valve.
7. Open V11 valve (Figure 5, Item 3) (Port D) on HEMTT.
8. Open dump valve (Figure 5, Item 4) on HEMTT.
9. Verify V6 valve (Figure 5, Item 2) on HEMTT is positioned to Fuel mode.

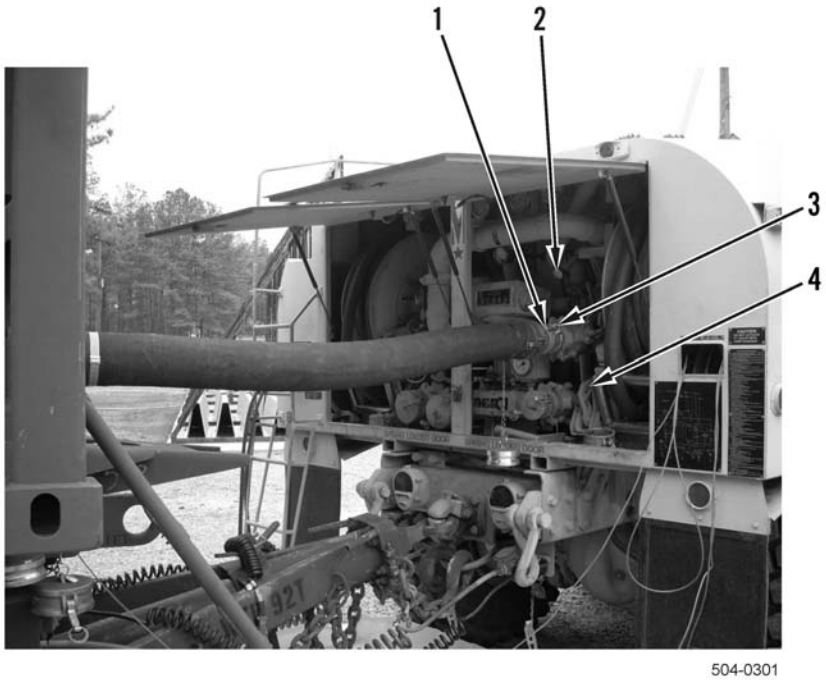


Figure 5. HEMTT Setup.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Set Up - Continued

10. Start fuel transfer in accordance with TM 9-2320-429-10 and as follows:
    a. Push PUMP ENGAGEMENT LEVER (Figure 6, Item 4) on HEMTT forward.
    b. Set TC/THROTTLE CONTROL switch (Figure 6, Item 3) up to ON position.
    c. Press HI/HIGH IDLE switch (Figure 6, Item 2).
    d. Pull out HAV HAND ACTUATED CONTROL valve (Figure 6, Item 1).

NOTE

HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

    e. Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve (Figure 6, Item 1).

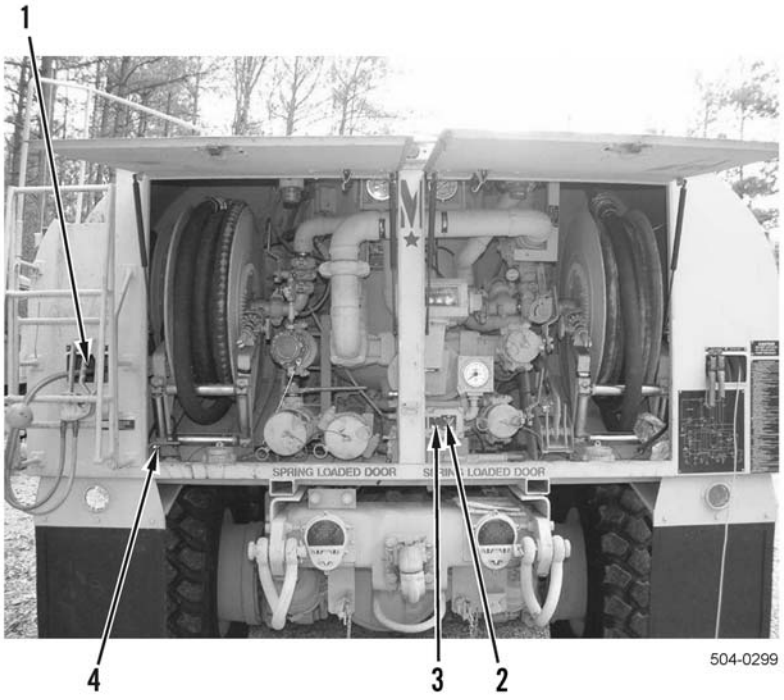


Figure 6. HEMTT Operation.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Set Up - Continued

NOTE

TRM must be on level ground for liquid level switch and fuel tank gauge to operate properly. Liquid level switch detects when fuel has reached maximum fill level of 2,500 gal. (9,464 L). When TRM is full, liquid level switch closes V2 valve and stops fuel flow into TRM.

11. Verify operation of liquid level switch by opening V6 valve (Figure 7, Item 1) on TRM. Fuel flow should stop in approximately 15 seconds.
    a. Close V6 valve (Figure 7, Item 1) on TRM if liquid level switch is operational.
    b. Close V6 valve (Figure 7, Item 1) on TRM if liquid level switch is not operational and have second 92F observe fuel flow from manhole cover.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

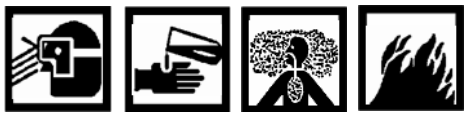
12. Continue fueling operations.

Figure 7. V6 Valve on TRM.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down

WARNING



Continue to squeeze and hold the HAV HAND ACTUATED CONTROL valve until hose evacuation is complete (V11 valve is closed). Failure to do so will result in equipment damage and personal injury.

1. Set TC/THROTTLE CONTROL switch (Figure 8, Item 4) down to OFF position when fuel transfer is complete.
2. Pull out HEMTT V6 valve (Figure 8, Item 2) to defuel position and open V6 valve (Figure 7, Item 1) on TRM.
3. Start hose evacuation process in accordance with TM 9-2320-429-10 and as follows:
   a. Set TC/THROTTLE CONTROL switch (Figure 8, Item 4) up to ON position.
   b. Press HI/HIGH IDLE switch (Figure 8, Item 3).
4. Operate HEMTT pump for approximately 2 minutes to evacuate fuel from TRM lower piping.
5. Close V13 valve (Port G) on TRM and continue to operate HEMTT pump for approximately 1 minute to evacuate fuel from 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose.

NOTE

Monitor HEMTT flow meter (Figure 8, Item 1) during hose evacuation.

6. Disconnect hose connection carefully at Port G on TRM to assist in hose evacuation process.
7. Verify vacuum is present.

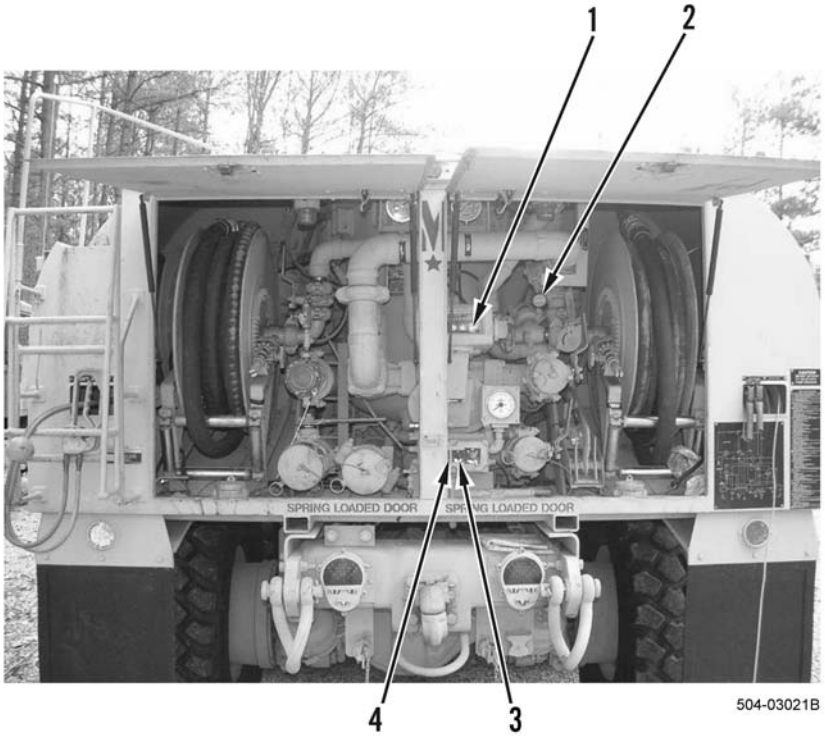


Figure 8. HEMTT Operation.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down - Continued

8. Lift 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose connection at TRM (Port G). Elevate and maintain above Port D (Figure 9, Item 4) height on HEMTT in order to assist in hose evacuation process.
9. Install dust cap on TRM Port G.
10. Close V11 valve (Figure 9, Item 3) (Port D) on HEMTT and install cap on 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose.
11. Stop HEMTT pump in accordance with TM 9-2320-429-10 and as follows:
    a. Set TC/THROTTLE CONTROL switch (Figure 9, Item 6) down to OFF position.
    b. Release HAV HAND ACTUATED CONTROL valve (Figure 9, Item 1) lever.
    c. Pull back on PUMP ENGAGEMENT LEVER (Figure 9, Item 7) until locked.
12. Lower 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose connection at TRM.
13. Disconnect 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose connection carefully from 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer at Port D (Figure 9, Item 4) on HEMTT and allow any residual fuel to drain in suitable drip pan.
14. Remove 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer from Port D (Figure 9, Item 4) on HEMTT.

CAUTION

Carefully guide HAV HAND ACTUATED CONTROL valve hoses through access hole onto reel. Failure to comply may result in damage to equipment.

15. Rewind HAV HAND ACTUATED CONTROL valve (Figure 9, Item 1) hoses onto reel.
16. Push in V6 valve (Figure 9, Item 2) on HEMTT to fuel position and close V6 valve (Figure 10, Item 1) on TRM.
17. Close dump valve (Figure 9, Item 5) on HEMTT.

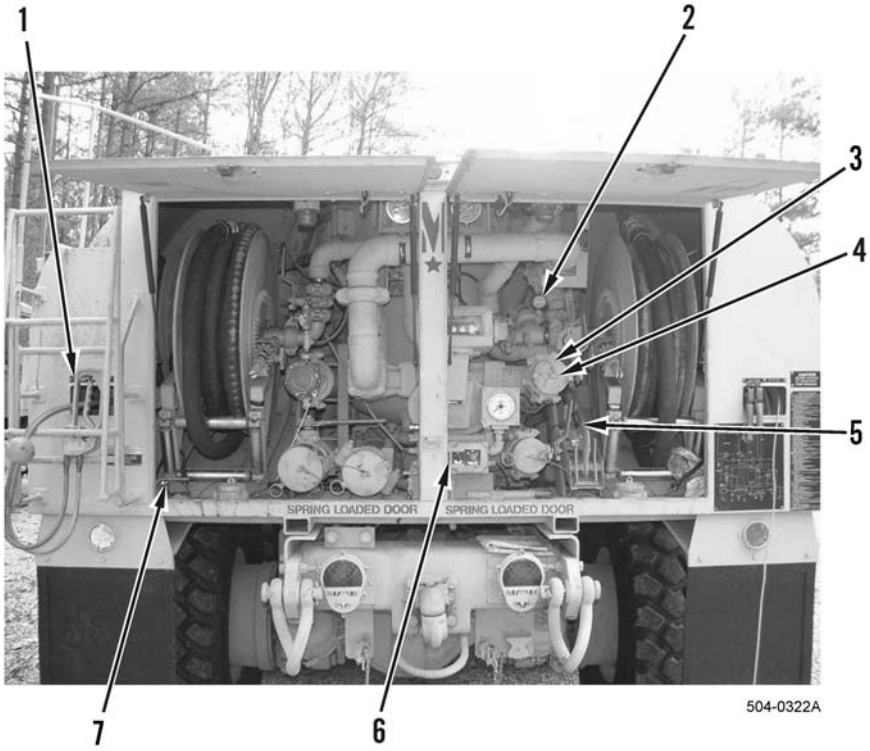


Figure 9. HEMTT Operation.

LONGITUDINAL TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down - Continued

Figure 10. V6 Valve on TRM.

18. Stow 4 in. x 6 ft (10.16 cm x 1.82 m) suction hose and 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer.
19. Close manhole covers on HEMTT and TRM.
20. Remove drip pan and dispose of contents per local SOP.

END OF TASK

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT)

Set Up

NOTE

- TRM to HEMTT transfer is not a defuel mission.
- Operation procedures below are typical. References are to TM 9-2320-429-10. Use TMs in References list in INITIAL SETUP for HEMTT tanker being used for fueling operations.

1. Close all valves on HEMTT and TRM (V1-V16).
2. Open manhole cover on HEMTT.

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) - CONTINUED

Set Up - Continued

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

3. Push down on manhole cover on TRM, release latch, and slowly open manhole cover to gradually release any pressure.

CAUTION

Length of hoses will depend on position of HEMTT and TRM. Ensure hoses are of sufficient length to rest on ground to prevent damage to equipment.

4. Connect 4 in. (10.16 cm) suction hose(s) to HEMTT and TRM.
   a. Connect hose to HEMTT Port B (Figure 11, Item 2) gravity receptacle.
   b. Remove dust cap and connect hose to TRM Port B.
5. Connect flange adapter assembly (D1) to HEMTT Port A (Figure 11, Item 1) receptacle (bottom load inlet).
6. Connect 3 in. x 3.5 ft (7.62 cm x 1.07 m) suction hose (straight end) to HEMTT Port C (Figure 11, Item 3) bulk receptacle.

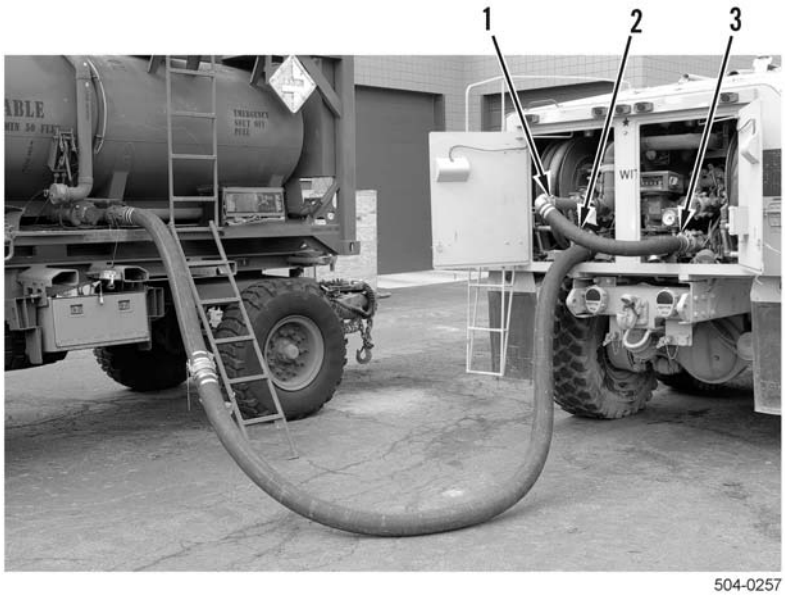


Figure 11. Transverse Transfer Using Vehicle Pump (TRM to HEMTT).

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) - CONTINUED

Set Up - Continued

7. Connect 3 in. x 3.5 ft (7.62 cm x 1.07 m) suction hose (elbow end) to flange adapter assembly (D1).
8. Open TRM V2 valve.
9. Open TRM V5 valve (Port B).
10. Position lever on flange adapter assembly (D1) to OPEN position.
11. Open V17 valve (Figure 12, Item 5) on HEMTT.
12. Open V18 valve (Figure 12, Item 2) on HEMTT and open V1 valve on HEMTT.
13. Start fuel transfer in accordance with TM 9-2320-429-10 and as follows:
    a. Start HEMTT and engage PTO.
    b. Push PUMP ENGAGEMENT LEVER (Figure 12, Item 6) on HEMTT forward.
    c. Set TC/THROTTLE CONTROL switch (Figure 12, Item 4) up to ON position.
    d. Pull out HAV HAND ACTUATED CONTROL valve (Figure 12, Item 1).

NOTE

HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

    e. Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve (Figure 12, Item 1).
    f. Press HI/HIGH IDLE switch (Figure 12, Item 3).

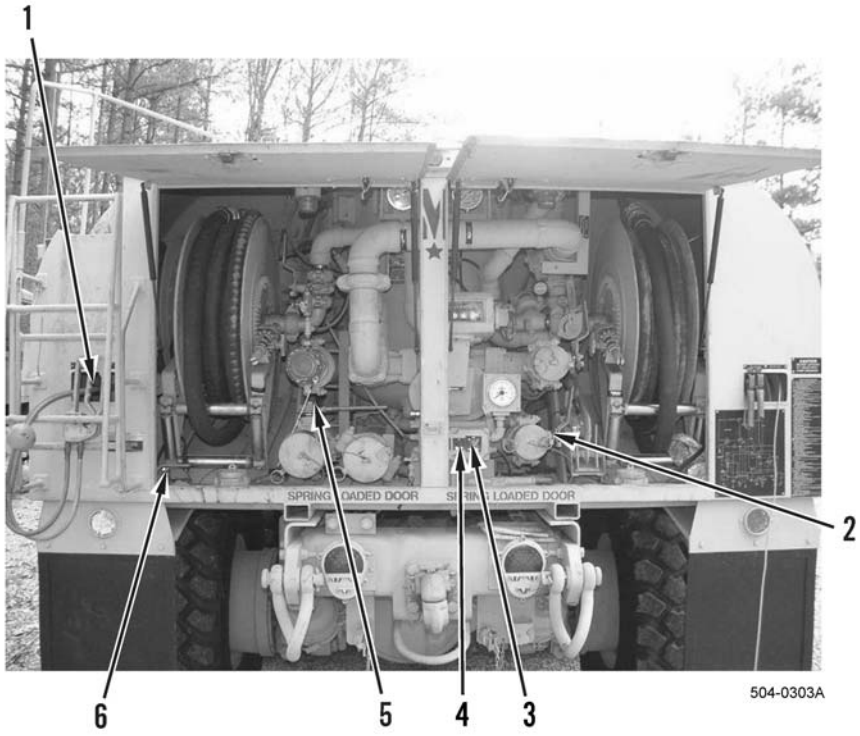
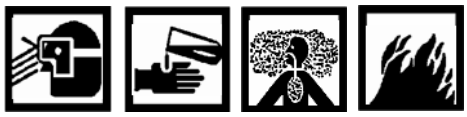


Figure 12. Transverse HEMTT Operation.

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down

WARNING



Continue to squeeze and hold HAV HAND ACTUATED CONTROL valve until hose evacuation is complete (V17 valve is closed). Failure to do so will result in equipment damage and personal injury.

1. Close V2 on TRM and open V6 valve (Figure 13, Item 1) on TRM when fuel transfer is complete.
2. Operate HEMTT pump for approximately 2 minutes to evacuate fuel from TRM lower piping.
3. Close V5 valve (Port B) on TRM and continue to operate HEMTT pump for approximately 2 to 3 minutes to evacuate fuel from hose(s).
4. Open vacuum breaker slowly at VB1 valve on TRM and close V6 valve (Figure 13, Item 1) on TRM.
5. Disconnect hose connection carefully at Port B on TRM to assist in hose evacuation process.
6. Verify vacuum is present and close VB1 valve.
7. Reinstall dust cap at TRM Port B.

Figure 13. V6 Valve on TRM.

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down - Continued

8. Lift hose connection at TRM and elevate above B Gravity Port on HEMTT (Figure 14, Item 4) in order to assist in hose evacuation process.

NOTE

Steps 9 through 13 uses multiple hoses.

9. Separate 4 in. (10.16 cm) suction hoses over a drip pan in the following manner:
   a. Disconnect connection carefully and immediately raise end of attached hose to a height above Port B (Figure 14, Item 4) on HEMTT.
   b. Discharge residual fuel from loose 4 in. (10.16 cm) suction hose in a drip pan.
10. Keep loose end of attached hose at a height above Port B (Figure 14, Item 4) on HEMTT and continue hose evacuation process.
11. Close V17 valve (Figure 14, Item 3) (Port B) at HEMTT and V1 valve on HEMTT.
12. Stop HEMTT pump in accordance with TM 9-2320-429-10 and as follows:
   a. Release HAV HAND ACTUATED CONTROL valve (Figure 14, Item 1) lever.
   b. Pull back on PUMP ENGAGEMENT LEVER (Figure 14, Item 5) until locked.
   c. Set TC/THROTTLE CONTROL switch (Figure 14, Item 2) down to OFF position.
13. Disconnect the hose from Port B (Figure 14, Item 4) on HEMTT and drain any residual fuel into a suitable container.

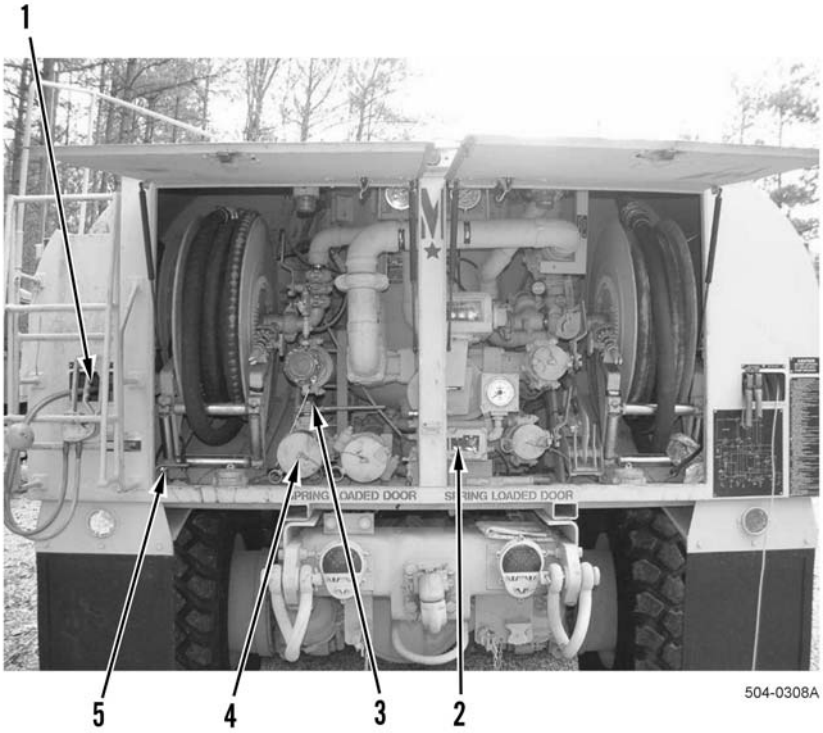


Figure 14. Transverse HEMTT Take Down.

TRANSVERSE TRANSFER USING VEHICLE PUMP (TRM TO HEMTT) – CONTINUED

Take Down - Continued

WARNING

The hose connection in the following steps will contain fuel. Use care to discharge excess fuel into drip pans and avoid contact. Failure to follow this warning may result in injury to personnel.

14. Close V18 valve (Figure 15, Item 6) on HEMTT.
15. Close D1 valve lever on D1 nozzle.
16. Disconnect the D1 nozzle carefully from Port A (Figure 15, Item 1) on HEMTT.
17. Lower hose D1 end of hose below height of Port C (Figure 15, Item 7).
18. Disconnect connection carefully at Port C (Figure 15, Item 7) on HEMTT and drain remaining fuel into suitable drip pan.
19. Disassemble the 3 in. x 3.5 ft (7.62 cm x 1.07 m) hose assembly and stow all hoses.
20. Close manhole covers on HEMTT and TRM.
21. Remove drip pan and dispose of contents per local SOP.

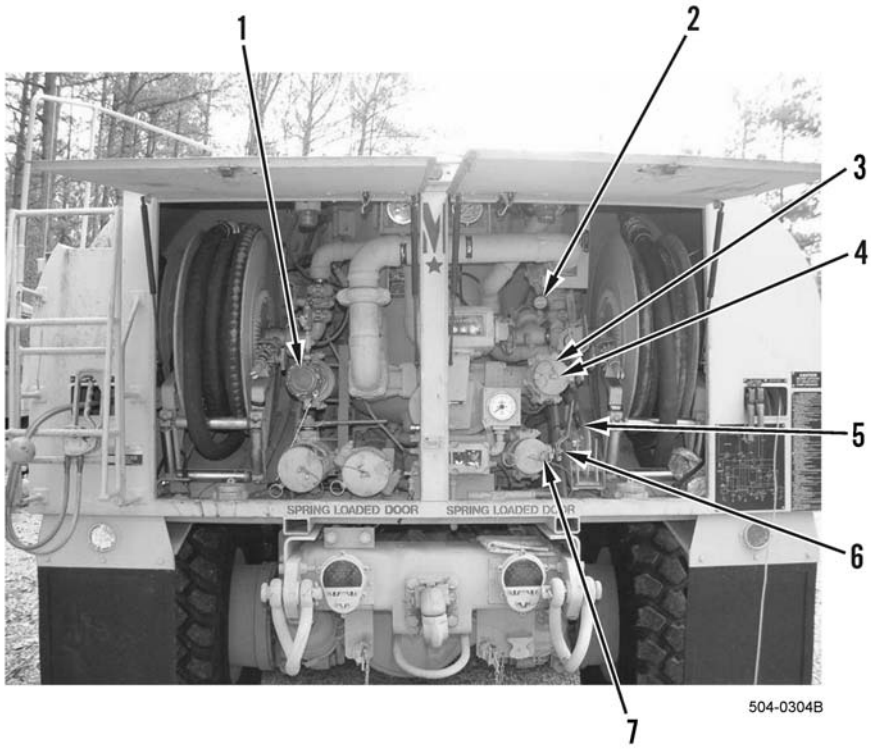


Figure 15. Transverse HEMTT Operation.

END OF TASK

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM)

Set Up

NOTE

Operation procedures below are typical. References are to TM 9-2320-429-10. Use TMs in References list in INITIAL SETUP for HEMTT tanker being used for fueling operations.

1. Close all valves on HEMTT and TRM (V1-V16).
2. Open manhole cover on HEMTT and remove vapor recovery cap.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

3. Push down on manhole cover on TRM, release latch, and slowly open manhole cover to gradually release any pressure.
4. Connect 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer to Port D (Figure 15, Item 4) on HEMTT.

CAUTION

Length of hoses will depend on position of HEMTT and TRM (may require multiple hoses). Ensure hoses are of sufficient length to rest on ground to prevent damage to equipment.

5. Connect 4 in. (10.16 cm) suction hoses to HEMTT and TRM.
   a. Connect 4 in. (10.16 cm) suction hose to 4 in. to 3 in. (10.16 cm x 7.62 cm) to reducer at Port D (Figure 15, Item 4) on HEMTT.
   b. Remove dust cap and connect 4 in. (10.16 cm) suction hose to port B on TRM.
6. Open TRM V5 valve.
7. Open V11 valve (Figure 15, Item 3) (Port D) on HEMTT.
8. Open dump valve (Figure 15, Item 5) on HEMTT.
9. Verify V6 valve (Figure 15, Item 2) on HEMTT is positioned to Fuel mode.

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) - CONTINUED

Set Up - Continued

10. Start fuel transfer in accordance with TM 9-2320-429-10 and as follows:
    a. Start HEMTT and engage PTO.
    b. Push PUMP ENGAGEMENT LEVER (Figure 16, Item 4) on HEMTT forward.
    c. Set TC/THROTTLE CONTROL switch (Figure 16, Item 3) up to ON position.
    d. Pull out HAV HAND ACTUATED CONTROL valve (Figure 16, Item 1).

NOTE

HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

    e. Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve (Figure 16, Item 1).
    f. Press HI/HIGH IDLE switch (Figure 16, Item 2).

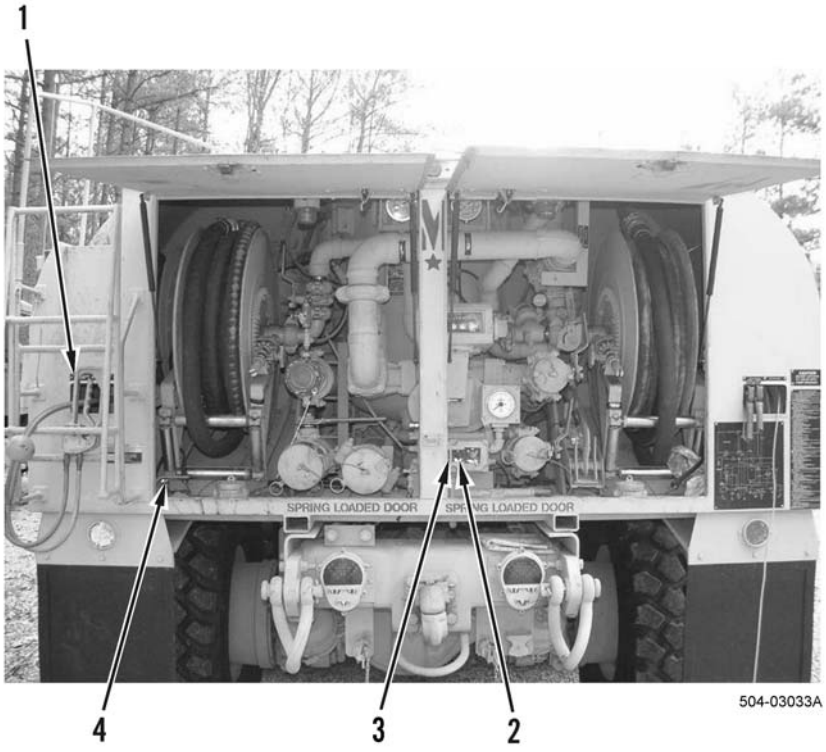


Figure 16. Transverse HEMTT Set Up.

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) - CONTINUED

Set Up - Continued

NOTE

TRM must be on level ground for liquid level switch and fuel tank gauge to operate properly. Liquid level switch detects when fuel has reached maximum fill level of 2,500 gal (9,464 L). When TRM is full, liquid level switch closes V2 valve and stops fuel flow into TRM.

11. Open V6 valve (Figure 17, Item 1) on TRM to verify operation of liquid level switch. Fuel flow should stop in approximately 15 seconds.
    a. Close V6 valve (Figure 17, Item 1) on TRM if liquid level switch is operational.
    b. Close V6 valve (Figure 17, Item 1) on TRM and have second 92F observe fuel flow from manhole cover if liquid level switch is not operational.

WARNING

Use a second person to observe filling operations to prevent overfilling. Overfilling the tank can lead to fuel spillage creating health and environmental damage and could result in injury or death.

12. Continue fueling operations.

Figure 17. V6 Valve on TRM.

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down

WARNING

Continue to squeeze and hold the HAV HAND ACTUATED CONTROL valve until hose evacuation is complete (V11 valve is closed). Failure to do so will result in equipment damage and personal injury.

1. Set TC/THROTTLE CONTROL switch (Figure 18, Item 8) down to OFF position when fuel transfer is complete.
2. Pull out HEMTT V6 valve (Figure 18, Item 3) to defuel position and open V6 valve (Figure 19, Item 1) on TRM.
3. Start hose evacuation process in accordance with TM 9-2320-429-10 and as follows:
   a. Set TC/THROTTLE CONTROL switch (Figure 18, Item 8) up to ON position.
   b. Press HI/HIGH IDLE switch (Figure 18, Item 7).
4. Operate HEMTT pump for approximately 2 minutes to evacuate fuel from TRM lower piping.
5. Close V5 valve (Port B) on TRM and continue to operate HEMTT pump for approximately 2 to 3 minutes to evacuate fuel from hose(s).

NOTE

Monitor HEMTT flow meter (Figure 18, Item 2) during hose evacuation.

6. Open vacuum breaker slowly at VB1 valve on TRM and close V6 valve (Figure 19, Item 1) on TRM.
7. Disconnect hose connection slowly at Port B on TRM to assist in hose evacuation process.
8. Verify vacuum is present and close VB1 valve.

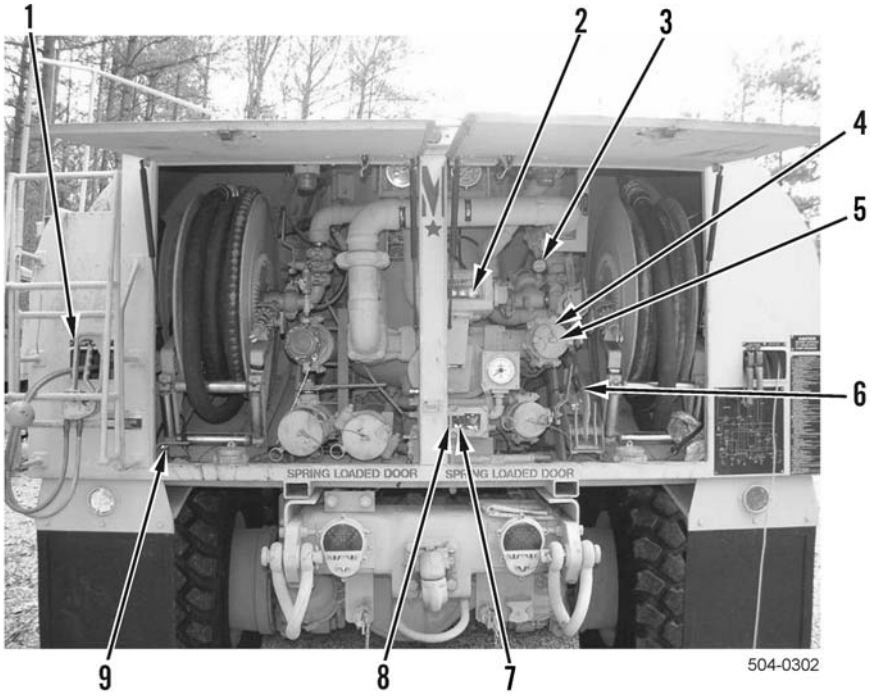


Figure 18. Transverse HEMTT Take Down.

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down - Continued

9. Reinstall dust cap at TRM Port B.
10. Lift hose connection at TRM (Port B). Elevate and maintain above Port D (Figure 18, Item 5) height on HEMTT in order to assist in hose evacuation process.

NOTE

Steps 11 to 16 use multiple hoses.

11. Separate 4 in. (10.16 cm) suction hoses over drip pan in the following manner:
    a. Disconnect connection carefully and immediately raise end of attached hose to a height above Port D (Figure 18, Item 5) on HEMTT.
    b. Discharge residual fuel from the loose 4 in. (10.16 cm) suction hose in drip pan.
12. Keep loose end of attached hose at a height above Port D (Figure 18, Item 5) on HEMTT and continue hose evacuation.
13. Close V11 valve (Figure 18, Item 4) (Port D) at HEMTT.
14. Close dump valve (Figure 18, Item 6) to HEMTT.
15. Stop HEMTT pump in accordance with TM 9-2320-429-10 and as follows:
    a. Release HAV HAND ACTUATED CONTROL valve (Figure 18, Item 1) lever.
    b. Pull back on PUMP ENGAGEMENT LEVER (Figure 18, Item 9) until locked.
    c. Set TC/THROTTLE CONTROL switch (Figure 18, Item 8) down to OFF position.
16. Disconnect 4 in. (10.16 cm) suction hose connection carefully from 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer at Port D (Figure 18, Item 5) on HEMTT and allow any residual fuel to drain into a suitable drip pan.
17. Remove 4 in. to 3 in. (10.16 cm to 7.62 cm) reducer from Port D (Figure 18, Item 5) on HEMTT.
18. Push in V6 valve (Figure 18, Item 3) on HEMTT to fuel position.
19. Close dump valve (Figure 18, Item 6) on HEMTT.

Figure 19. V6 Valve on TRM.

TRANSVERSE TRANSFER USING VEHICLE PUMP (HEMTT TO TRM) – CONTINUED

Take Down - Continued

20. Stow all 4 in. (10.16 cm) hoses.
21. Close manhole covers on HEMTT and TRM.
22. Remove drip pan and dispose of contents per local SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
OPERATE TRM

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
MIL-STD-3004D

References - Continued

WP 0002
WP 0007
WP 0008
WP 0009
WP 0010
WP 0012
WP 0013
WP 0014
WP 0027

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

CAUTION

Perform quality surveillance operations on all bulk fuel receipts and TRM fuel issues, per MIL-STD-3004D, Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products to prevent damage to equipment.

NOTE

Retail issue is defined as any issue that goes into consuming equipment or is packaged. Packaged fuel can be in 5 gal. (18.93 L) cans, 55 gal. (208.2 L) drums, or 500 gal. (1,892.71 L) collapsible drums.

TRM OPERATING PROCEDURES

1. Receive bulk fuel as follows:

   Receive fuel from tank truck (WP 0007, WP 0008, WP 0009, and WP 0010).
2. Store fuel as follows:
   a. Shut down operations (WP 0027).
   b. Store fuel in tank. Tank has storage capacity of 2,500 gal. (9,464 L) (WP 0002).

TRM OPERATING PROCEDURES – CONTINUED

3. Dispense fuel by one of the following methods:
   - Bulk issue (WP 0014).
   - Retail issue (WP 0012 and WP 0013).

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
CHECK FUEL LEVEL WITH GAUGE STICK

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gauge stick (WP 0066, Table 2, Item 14)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Materials/Parts

Cloth, cleaning (WP 0067, Item 4)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1

Equipment Condition

TRM shut down (WP 0027)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

CHECK FUEL LEVEL

1. Unhook spring snap clip (Figure 1, Item 1) and remove cover (Figure 1, Item 3) from tube (Figure 1, Item 2).

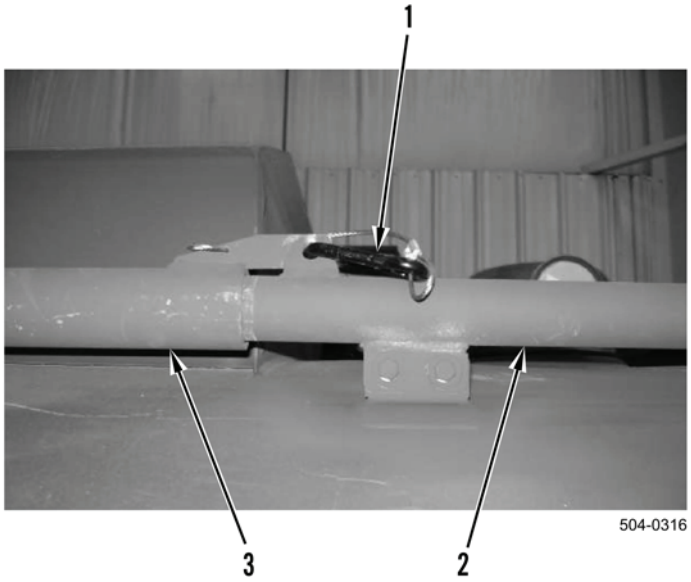


Figure 1. Stowage Tube Assembly.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover (Figure 2, Item 1), release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove gauge stick (Figure 2, Item 3) from tube (Figure 2, Item 2).
4. Lower gauge stick (Figure 2, Item 3) into tank until gauge stick touches bottom of tank.
5. Remove gauge stick (Figure 2, Item 3) and check marking for fuel level in tank.
6. Wipe off gauge stick (Figure 2, Item 3) and slide it into tube (Figure 2, Item 2).

CHECK FUEL LEVEL - CONTINUED

7. Close manhole cover (Figure 2, Item 1).
8. Install cover (Figure 1, Item 3) on tube (Figure 1, Item 2) and hook spring snap clip (Figure 1, Item 1).

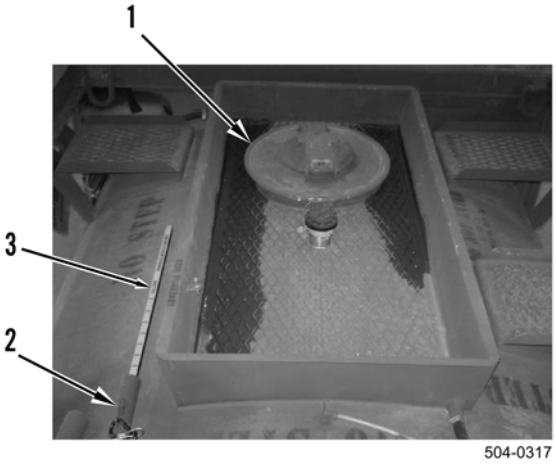


Figure 2. Checking Fuel Level.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
DRAIN TRM
Drain TRM Tank Assembly Using Port B, Drain TRM Tank Assembly Using Port A

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Camlock adapter (WP 0066, Table 1, Item 6)
Flange adapter assembly (D1) (WP 0066, Table 1, Item 12)
Hose, discharge, 4 in. x 15 ft (10.16 cm x 4.6 m) (WP 0066, Table 1, Item 3) Qty: 2

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004

Equipment Condition

TRM shut down (WP 0027)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Ensure drip pans are placed at disconnect points.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

DRAIN TRM TANK ASSEMBLY USING PORT B

1. Close all valves (V1-V16).
2. Connect two 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses and connect male end of one hose to Port B.
3. Connect camlock adapter to end of suction hose.
4. Connect camlock adapter to external transfer pump.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

5. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
6. Remove dust cap from bottom of vapor recovery line.
7. Open V5 valve.
8. Open V2 valve.
9. Open valve on camlock adapter and start external transfer pump to begin defueling operations through Port B.
10. Close V2 valve.
11. Close V5 valve.
12. Start hose evacuation using external transfer pump to continue defueling operations.
13. Place suitable container under vacuum breaker VB1 valve and slowly open VB1 valve.
14. Disconnect two 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses carefully at Port B to assist hose evacuation.
15. Verify vacuum is present and close VB1 valve.
16. Lift hose end disconnected from Port B above height of supply source for approximately two minutes to assist in hose evacuation.
17. Close camlock adaptor at external transfer pump after hoses are evacuated.
18. Close supply source valve and shut off external transfer pump.
19. Discharge residual fuel carefully from 4 in. x 15 ft (10.16 cm x 4.6 m) suction hose into drip pans.
20. Disconnect hose carefully from supply source and discharge any remaining fuel into drip pans.
21. Install dust cap and plugs on hose, Port B, and bottom of vapor recovery line.
22. Close manhole cover.
23. Remove drip pans and containers and dispose of contents per local SOP.

END OF TASK

DRAIN TRM TANK ASSEMBLY USING PORT A

1. Close all valves (V1-V16).
2. Connect D1 nozzle from external source to Port A.

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

3. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
4. Remove dust cap from bottom of vapor recovery line.
5. Open V2 valve.
6. Start external transfer pump and begin draining operation.
7. Evacuate hoses using external transfer pump after draining is complete.
8. Close V2 valve after hoses are evacuated.
9. Disconnect D1 nozzle from Port A.
10. Close manhole cover and install dust cap on bottom of vapor recovery line.
11. Remove drip pan and dispose of contents per local SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
BULK UNLOAD THROUGH PORT B USING NATO ADAPTER

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Materials/Parts

Camlock adapter (WP 0066, Table 1, Item 6)
Hose, discharge, 4 in. x 15 ft (10.16 cm x 4.6 m) (WP 0066, Table 1, Item 3) Qty: 2
Parts kit, quick-disconnect coupling assembly (NATO adapter assembly, female) (WP 0066, Table 1, Item 13)
Reducer, quick-disconnect, 3 to 4 in. (7.62 cm to 10.16 cm) (WP 0066, Table 1, Item 11)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0016

Equipment Condition

TRM shut down (WP 0027)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.
- Ensure drip pans are placed at disconnect points.

BULK UNLOAD THROUGH PORT B USING NATO ADAPTER PROCEDURES

1. Close all valves (V1-V16).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Remove dust cap from bottom of vapor recovery line.
4. Remove plug from Port B and connect two 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses to Port B (Figure 1).
5. Remove dust cap and plug from camlock adapter and connect to 4 in. x 15 ft (10.16 cm x 4.6 m) hose.
6. Connect quick-disconnect reducer to camlock adapter (Figure 1).
7. Remove cap and plug from female NATO adapter and connect to reducer (Figure 1).
8. Connect female NATO adapter to NATO asset transfer pump.
9. Open V2 valve with control lever (Figure 1).
10. Open V5 valve (Figure 1).
11. Open camlock adapter (Figure 1).
12. Start NATO asset pump to begin defueling operations through Port B (Figure 1).
13. Shut off V2 valve, V5 valve, camlock adapter, and stop NATO asset transfer pump after defueling is complete.
14. Evacuate hose assembly using NATO asset transfer pump. If not possible, proceed to step 23.
15. Place suitable container under vacuum breaker VB1 valve and slowly open VB1 valve (Figure 1).
16. Disconnect 4 in. (10.16 cm) hose connection carefully at Port B to assist hose evacuation.
17. Verify vacuum is present and close VB1 valve.
18. Lift hose end disconnected from Port B above height of supply source for approximately two minutes to assist in hose evacuation.
19. Close supply source valve and shut off NATO asset transfer pump.
20. Discharge residual fuel carefully from 4 in. (10.16 cm) hoses into drip pans.
21. Disconnect hose carefully from NATO asset transfer pump and discharge any remaining fuel into drip pans.
22. Install dust cap and plugs on hoses, Port B, quick-disconnect reducer, female NATO connector, and NATO asset pump.
23. Place drip pan under female NATO adapter and carefully disconnect from NATO asset transfer pump and drain residual fuel.
24. Place drip pan under quick-disconnect reducer and carefully remove from camlock adapter and drain residual fuel. Install cap.
25. Close manhole cover and install dust cap on bottom of vapor recovery line.
26. Evacuate and disassemble hoses (WP 0016).
27. Remove drip pans and containers and dispose of contents per local SOP.

BULK UNLOAD THROUGH PORT B USING NATO ADAPTER PROCEDURES - CONTINUED

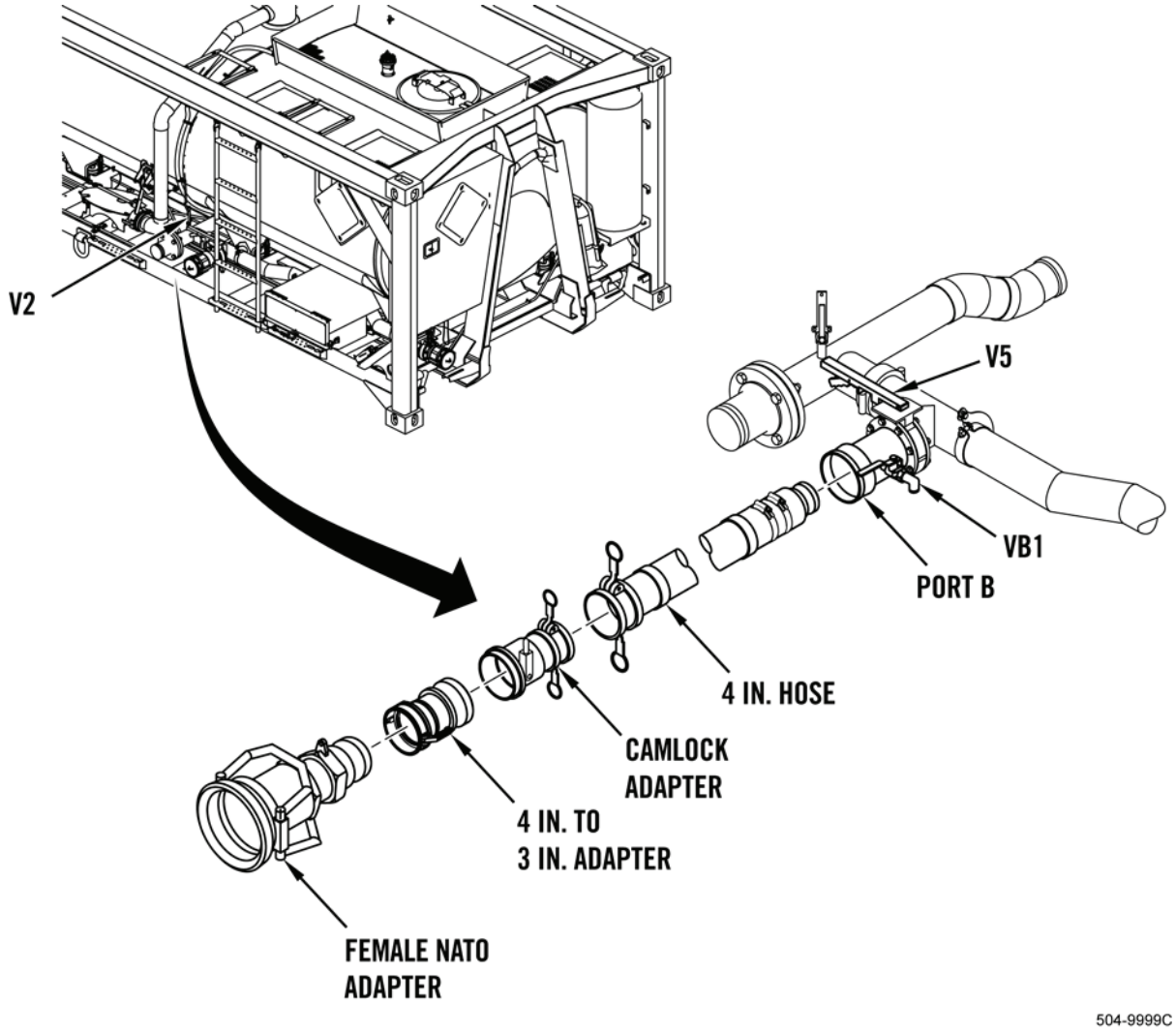


Figure 1. Bulk Unload Through Port B Using NATO Adapter.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
ROLLER ASSEMBLY HARD SURFACE EMPLACEMENT/RETRIEVAL
Remove Roller from Storage Position, Emplace Roller in Operational Position, Retrieve Roller from Operational Position and Place in Storage Position

INITIAL SETUP

Personnel Required	Equipment Condition
Two	TRM shut down (WP 0027) TRM mounted on PLS/LHS (WP 0017)

REMOVE ROLLER FROM STORAGE POSITION

1. Unlock two pin locks (Figure 1, Item 1) securing two pins (Figure 1, Item 4) in roller assembly (Figure 1, Item 3) and TRM frame (Figure 1, Item 5).
2. Remove two pins (Figure 1, Item 4) with lanyards (Figure 1, Item 2) from roller assembly (Figure 1, Item 3) and TRM frame (Figure 1, Item 5).
3. Remove roller assembly (Figure 1, Item 3) from TRM frame (Figure 1, Item 5).

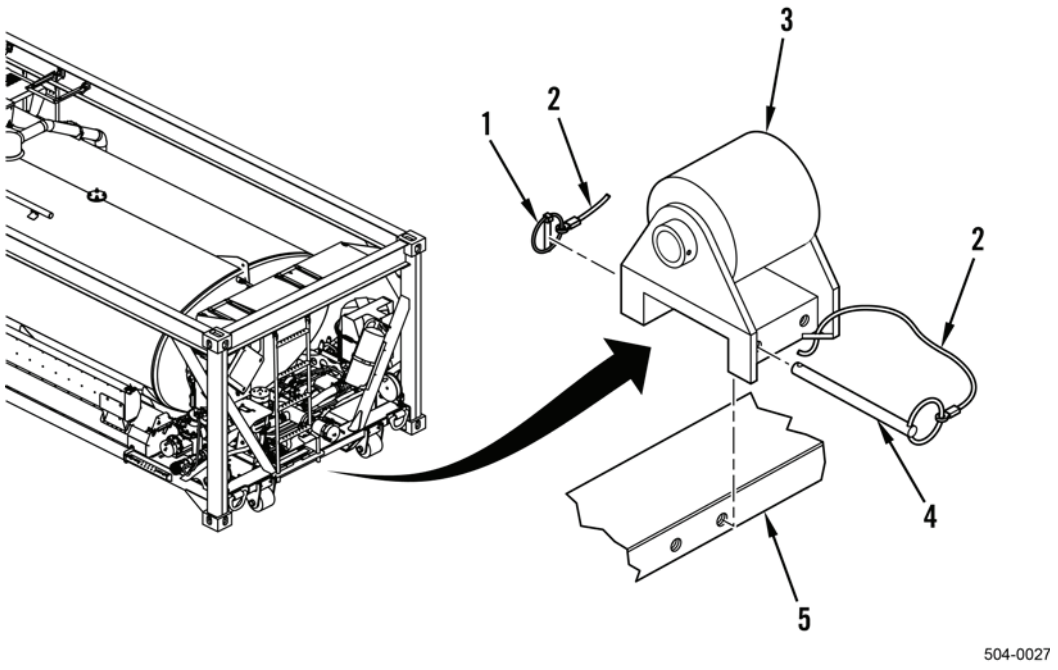


Figure 1. Remove Roller Assembly.

4. Perform steps 1, 2, and 3 on the second roller assembly.

END OF TASK

EMPLACE ROLLER IN OPERATIONAL POSITION

1. Position roller assembly (Figure 2, Item 4) under TRM frame (Figure 2, Item 1) with roller toward rear of TRM.
2. Install two pins (Figure 2, Item 2) through holes in roller assembly (Figure 2, Item 4) and TRM frame (Figure 2, Item 1).
3. Route two lanyards (Figure 2, Item 3) over TRM frame (Figure 2, Item 1).
4. Lock two pin locks (Figure 2, Item 5) securing pins (Figure 2, Item 2) in roller assembly (Figure 2, Item 4) and TRM frame (Figure 2, Item 1).

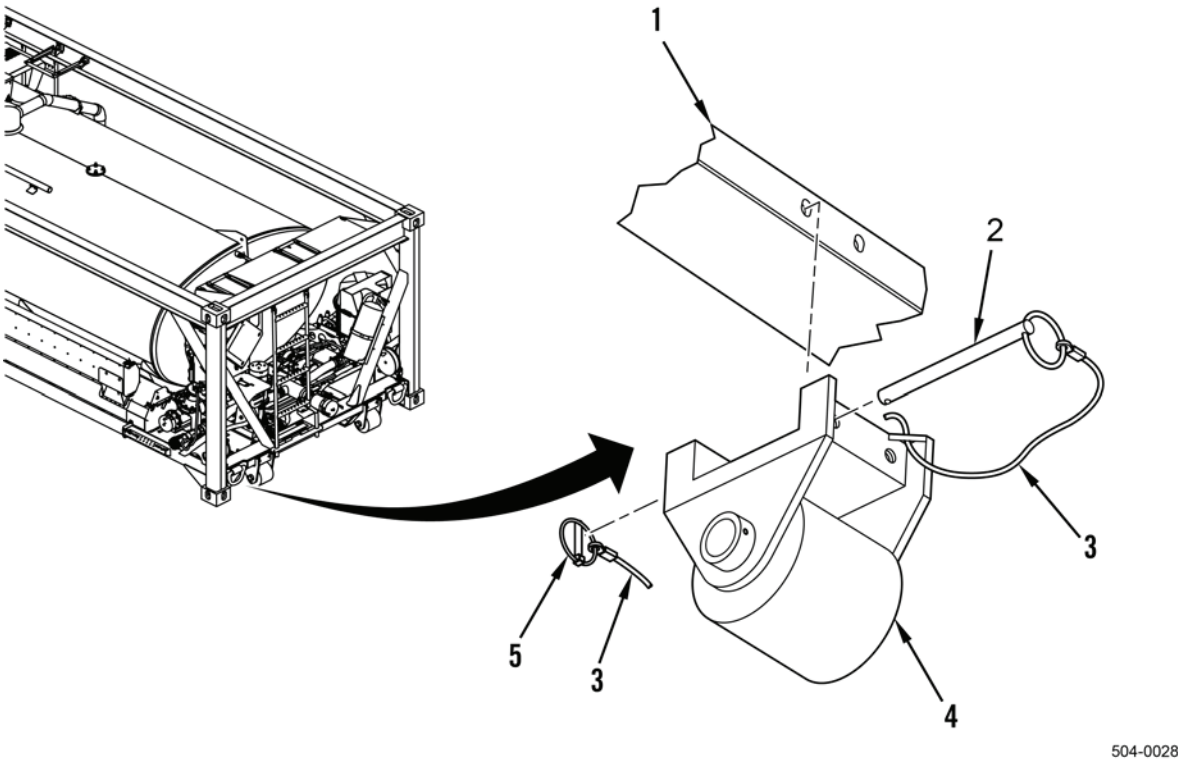


Figure 2. Emplace Roller Assembly.

5. Perform steps 1 thru 4 on the second roller assembly.

END OF TASK

RETRIEVE ROLLER FROM OPERATIONAL POSITION AND PLACE IN STORAGE POSITION

1. Unlock two pin locks (Figure 2, Item 5) securing two pins (Figure 2, Item 2) in roller assembly (Figure 2, Item 4) and TRM frame (Figure 2, Item 1).
2. Remove two pins (Figure 2, Item 2) and two lanyards (Figure 2, Item 3) from roller assembly (Figure 2, Item 4) and TRM frame (Figure 2, Item 1).
3. Remove roller assembly (Figure 2, Item 4) from TRM frame (Figure 2, Item 1).

RETRIEVE ROLLER FROM OPERATIONAL POSITION AND PLACE IN STORAGE POSITION - CONTINUED

4. Position roller assembly (Figure 3, Item 3) in storage position.
5. Route two lanyards (Figure 3, Item 2) under TRM frame (Figure 3, Item 5).
6. Install two pins (Figure 3, Item 4); one pin passes through hole in roller assembly (Figure 3, Item 3) and TRM frame (Figure 3, Item 5), and second through hole in TRM frame.
7. Lock two pin locks (Figure 3, Item 1) securing pins (Figure 3, Item 4) in roller assembly (Figure 3, Item 3) and TRM frame (Figure 3, Item 5).

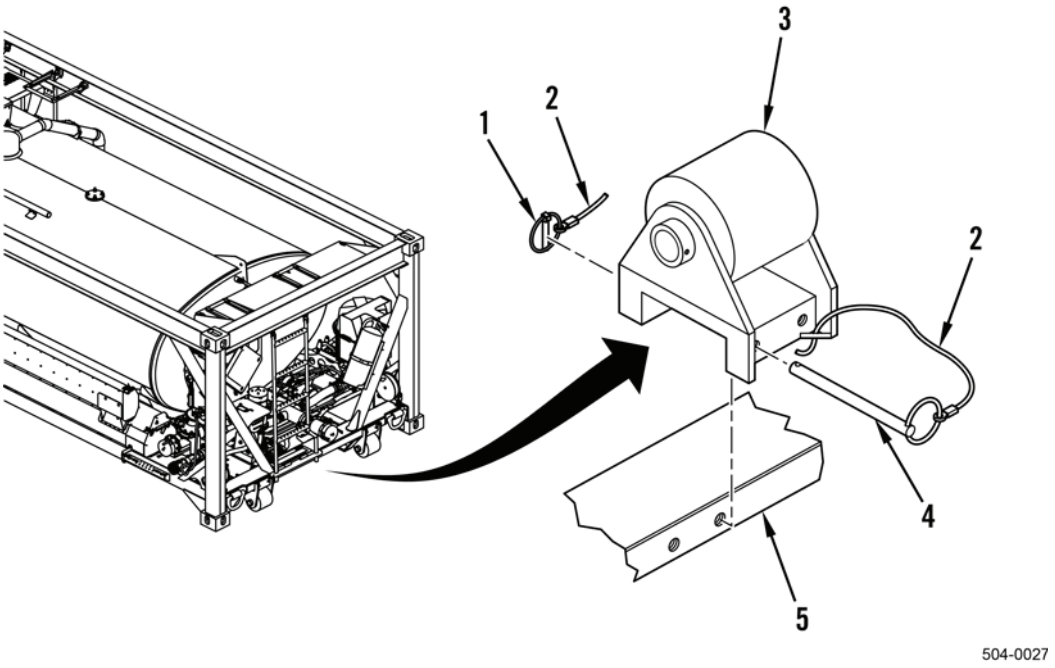


Figure 3. Install Roller Assembly.

8. Perform steps 1 thru 7 on the second roller assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
LADDER
Removal, Installation

INITIAL SETUP

Personnel Required	Equipment Condition
Two	TRM shut down (WP 0027)
	TRM mounted on PLS trailer (WP 0017)

WARNING

Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Failure to comply could result in injury or death to personnel.

NOTE

The ladder provides easy access to the TRM deck.

REMOVAL

1. Release two clamping catches (Figure 1, Item 1) and remove ladder (Figure 1, Item 2) from brackets (Figure 1, Item 3).

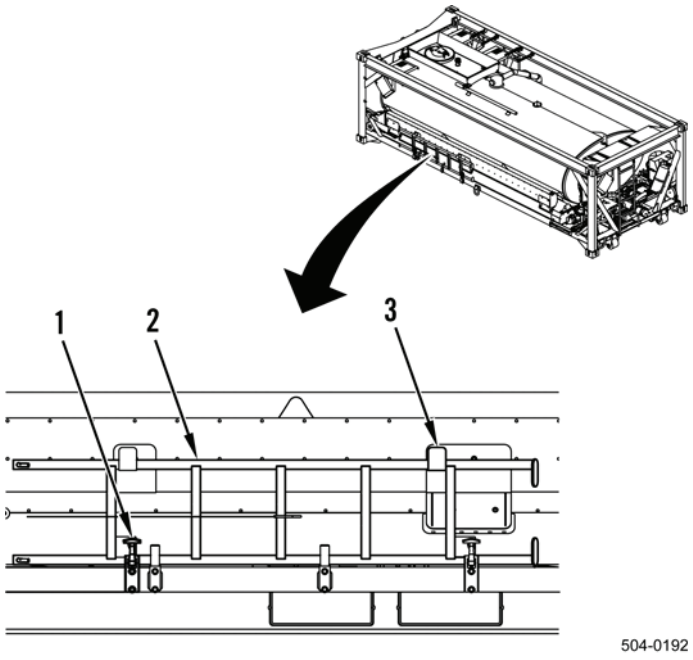


Figure 1. Removal of Ladder.

REMOVAL – CONTINUED

2. Insert ladder hooks (Figure 2, Item 2) in ladder mount slots (Figure 2, Item 1).

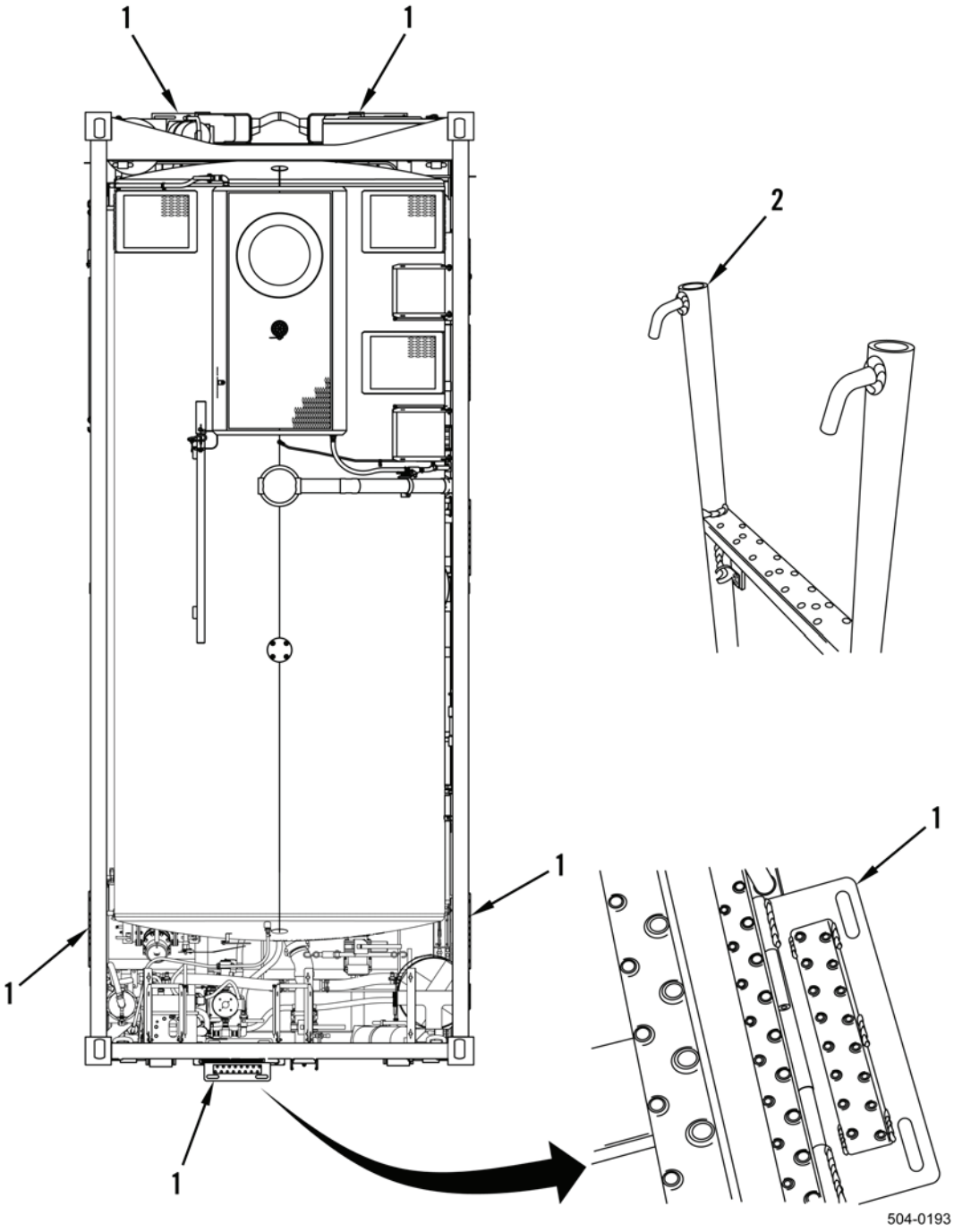


Figure 2. Ladder Mounts.

END OF TASK

INSTALLATION

Stow ladder (Figure 3, Item 2) on brackets (Figure 3, Item 3) and secure with two clamping catches (Figure 3, Item 1).

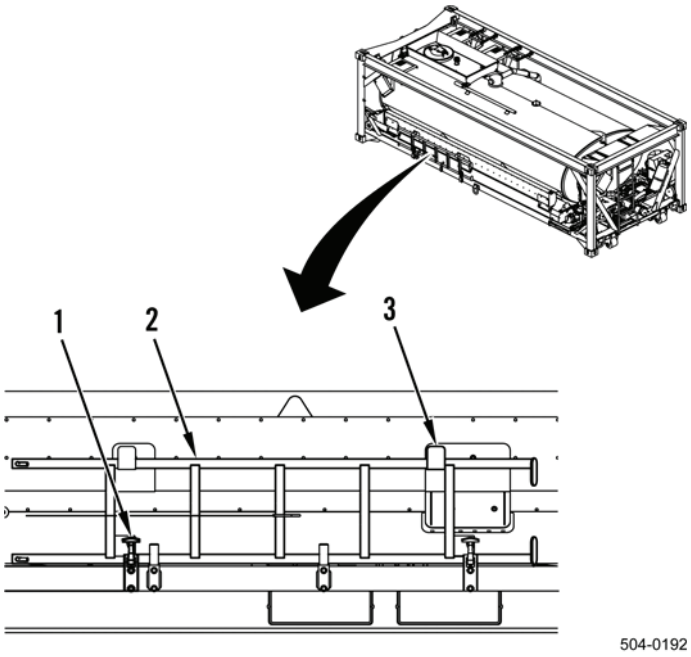


Figure 3. Installation of Ladder.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
POSITION MANHOLE COVER FOR TRANSPORT/OPERATION

Position Manhole Cover for Transport, Railcar Movement, Position Vent Valve Hold-Downs for Aircraft Movement, Position Vent Valve for Operation, Position Manhole Cover for Operation

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Hammer, hand (WP 0066, Table 2, Item 2)
Respirator, air filtering (WP 0067, Item 12)
Screwdriver, flat tip (WP 0066, Table 2, Item 7)
Wrench, 9/16 in., box and open end (WP 0066, Table 2, Item 12)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0002
WP 0026

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

Transporter cover is located on right side of TRM frame (WP 0002).

POSITION MANHOLE COVER FOR TRANSPORT

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

1. Push down on manhole cover, lift latch (Figure 1, Item 2) and open manhole cover (Figure 1, Item 3) enough to allow pressure to escape.
2. Close manhole cover (Figure 1, Item 3).
3. Remove nut (Figure 1, Item 8), washer (Figure 1, Item 7), and capscrew (Figure 1, Item 6) from clamp (Figure 1, Item 1) with a 9/16 in. wrench.
4. Remove clamp (Figure 1, Item 1) and manhole cover (Figure 1, Item 3) from tank assembly (Figure 1, Item 4).
5. Remove transporter cover (Figure 1, Item 5) from right side of TRM frame (WP 0002).
6. Ensure transporter cover seal is serviceable and in place. If seal is unserviceable or missing, contact Field Maintenance.
7. Align and install transporter cover (Figure 1, Item 5) with vent side up and clamp (Figure 1, Item 1) on tank assembly (Figure 1, Item 4).
8. Install capscrew (Figure 1, Item 6), washer (Figure 1, Item 7), and nut (Figure 1, Item 8) in clamp (Figure 1, Item 1).
9. Tighten nut (Figure 1, Item 8) to secure clamp (Figure 1, Item 1) on transporter cover (Figure 1, Item 5). Use hammer to tap the clamp while tightening the nut.
10. Stow manhole cover (Figure 1, Item 3) on right side of TRM frame (WP 0002).

POSITION MANHOLE COVER FOR TRANSPORT - CONTINUED

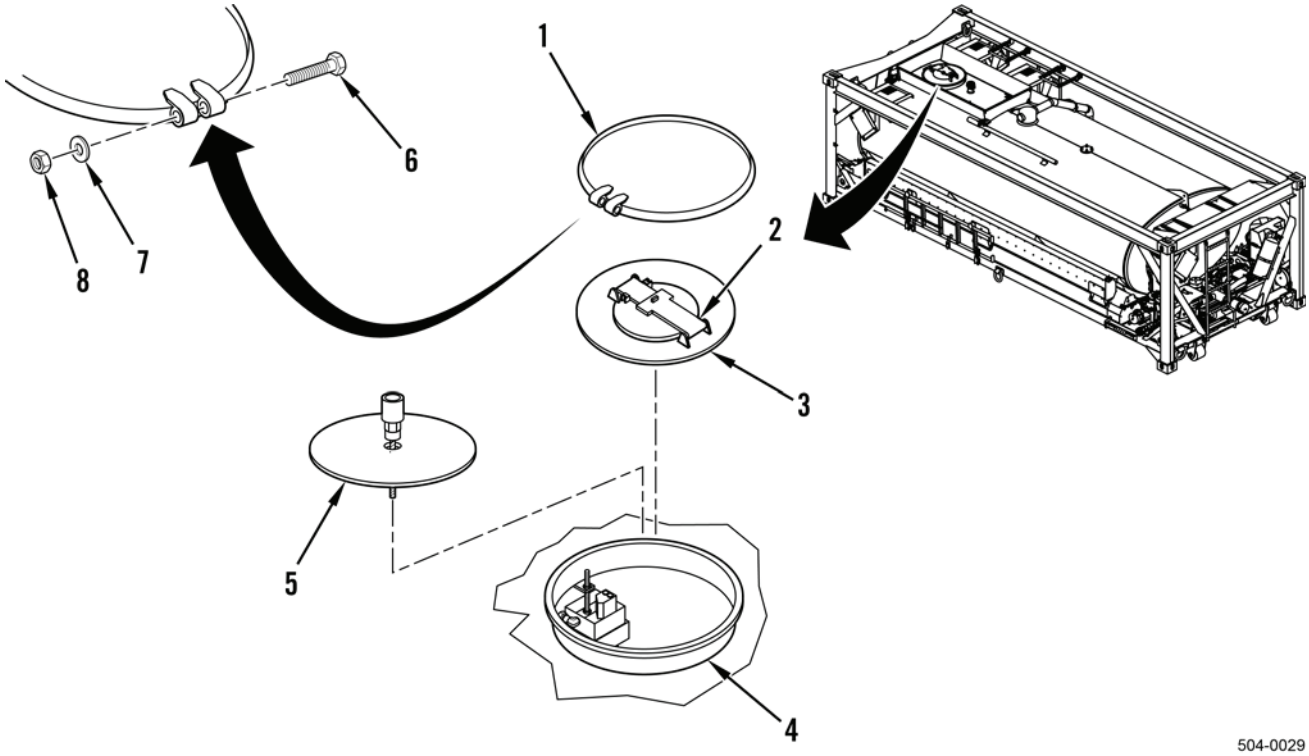


Figure 1. Manhole and Transporter Cover.

END OF TASK

RAILCAR MOVEMENT

NOTE

If TRM is EMPTY, it can be transported without transporter cover modification.

1. Install transporter cover per steps 1 thru 10 in positioning manhole cover for transport to transport TRM filled with fuel.
2. Secure TRM on railcar per local and unit rail transportation SOPs.

END OF TASK

POSITION VENT VALVE HOLD-DOWNS FOR AIRCRAFT MOVEMENT

NOTE

If TRM is EMPTY, it can be transported without transporter cover modification.

1. Purge tank if required (WP 0026).
2. Install transporter cover per steps 1 thru 10 in positioning manhole cover for transport to transport TRM filled with fuel.
3. Install vent valve hold-downs using the steps that follow:
   a. Make sure V2 valve is closed.
   b. Loosen band clamp (Figure 2, Item 4) on rubber vent hood (Figure 2, Item 3).
   c. Push rubber vent hood (Figure 2, Item 3) back to gain access to vent cover plate (Figure 2, Item 2).
   d. Remove three screws (Figure 2, Item 1) and cover plate (Figure 2, Item 2).

NOTE

Hold-downs and screws are stored under the cover plate when not in use.

   e. Locate two screws (Figure 2, Item 6) and two hold-downs (Figure 2, Item 5) on top of vent valve (Figure 2, Item 7).
   f. Install two screws (Figure 2, Item 6) through hold-downs (Figure 2, Item 5) and use a flat tip screwdriver to install screws and hold-downs into small holes in vent valve (Figure 2, Item 7).
   g. Position hold-downs (Figure 2, Item 5) so they clamp around vent valve (Figure 2, Item 7).
   h. Tighten two screws (Figure 2, Item 6).
   i. Install cover plate (Figure 2, Item 1) on vent valve (Figure 2, Item 7) and install three screws (Figure 2, Item 1).
   j. Reposition rubber vent hood (Figure 2, Item 3) over vent valve (Figure 2, Item 7).
   k. Tighten band clamp (Figure 2, Item 4).
4. Secure TRM on aircraft per local and unit aircraft transportation SOPs.

END OF TASK

POSITION VENT VALVE FOR OPERATION

NOTE

If TRM has been transported by aircraft, vent valve hold-downs may be installed.

1. Loosen band clamp (Figure 2, Item 4) on rubber vent hood (Figure 2, Item 3).
2. Push rubber vent hood (Figure 2, Item 3) back to gain access to vent cover plate (Figure 2, Item 2).
3. Remove three screws (Figure 2, Item 1) and cover plate (Figure 2, Item 2).
4. Remove two screws (Figure 2, Item 6) and hold-downs (Figure 2, Item 5) with a flat tip screwdriver.
5. Stow hold-downs (Figure 2, Item 5) and screws (Figure 2, Item 6) in vent valve cavity under cover plate (Figure 2, Item 2).
6. Install cover plate (Figure 2, Item 1) on vent valve (Figure 2, Item 7) and install three screws (Figure 2, Item 1).
7. Reposition rubber vent hood (Figure 2, Item 3) over vent valve (Figure 2, Item 7).
8. Tighten band clamp (Figure 2, Item 4).

POSITION VENT VALVE FOR OPERATION - CONTINUED

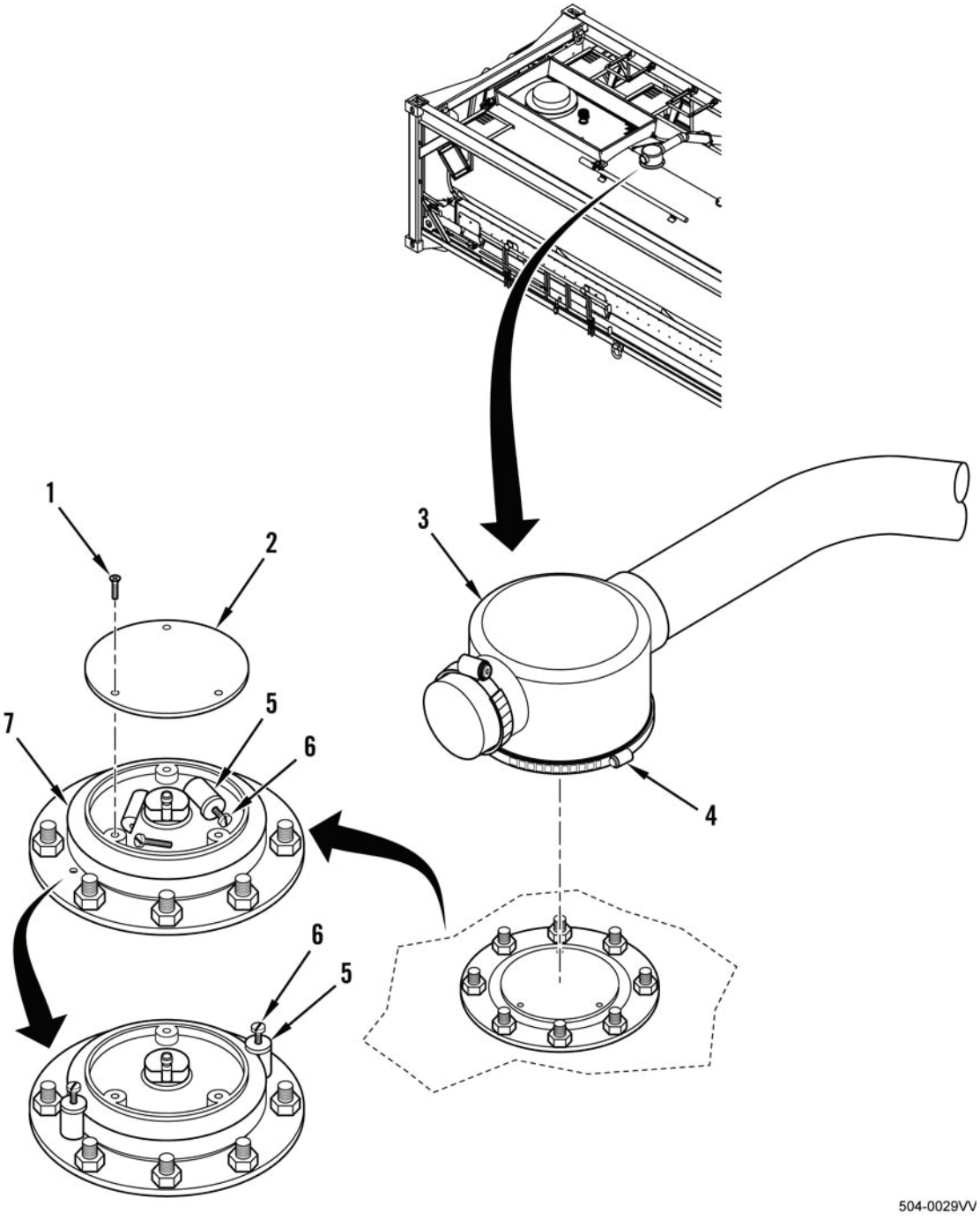


Figure 2. Installation and Removal of Vent Valve Hold-downs.

END OF TASK

POSITION MANHOLE COVER FOR OPERATION

1. Remove nut (Figure 3, Item 8), washer (Figure 3, Item 7), and capscrew (Figure 3, Item 6) from clamp (Figure 3, Item 1).
2. Remove clamp (Figure 3, Item 1) and transporter cover (Figure 3, Item 5) from tank assembly (Figure 3, Item 4).
3. Remove manhole cover (Figure 1, Item 3) from right side of TRM frame (WP 0002).
4. Ensure manhole cover seal is serviceable and in place. If seal is unserviceable or missing, contact Field Maintenance.
5. Align and install manhole cover (Figure 3, Item 3) and clamp (Figure 3, Item 1) on tank assembly (Figure 3, Item 4).
6. Install capscrew (Figure 3, Item 6), washer (Figure 3, Item 7), and nut (Figure 3, Item 8).
7. Tighten nut (Figure 3, Item 8) to secure clamp (Figure 3, Item 1) on manhole cover (Figure 3, Item 3) and use hammer to tap clamp while tightening nut.
8. Stow transporter cover (Figure 3, Item 5) on right side of TRM frame (WP 0002).

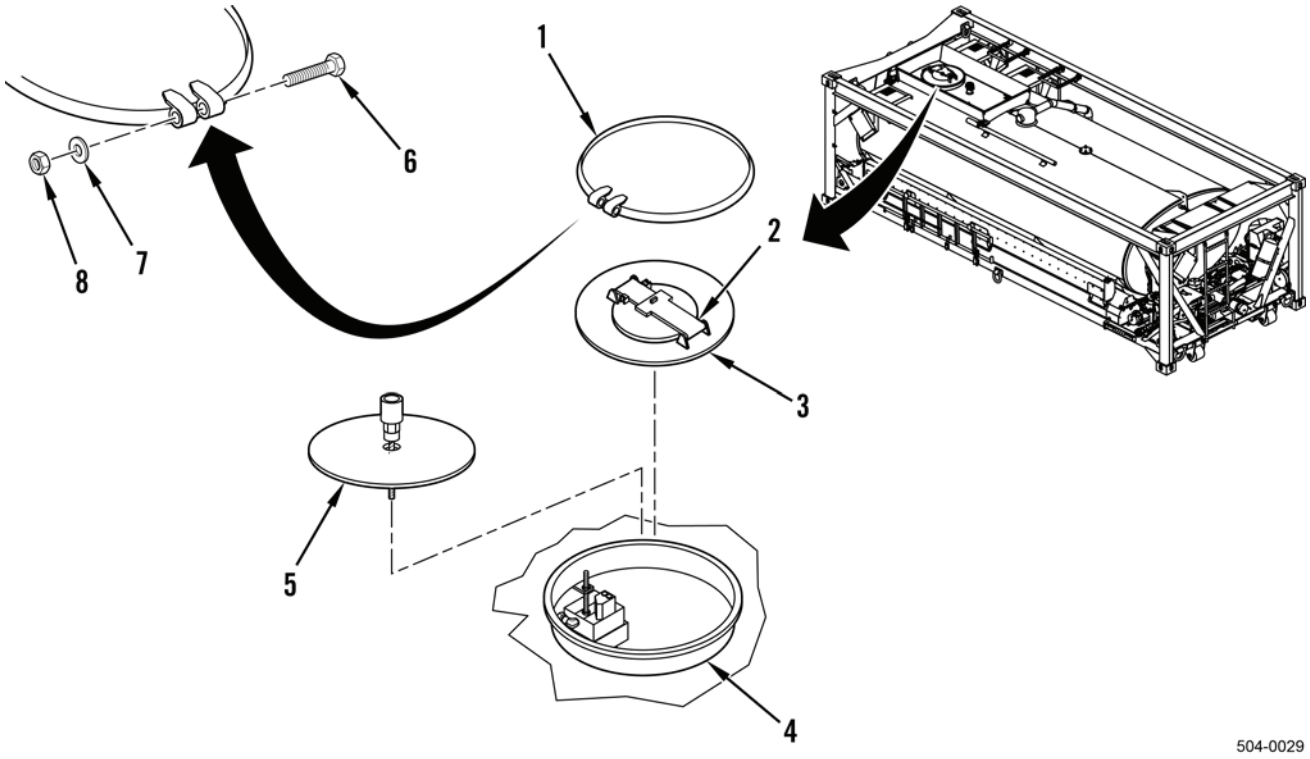


Figure 3. Manhole Cover Position for Operation.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
PREPARE TRM FOR MOVEMENT
Purging

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Materials/Parts

Cleaning compound, solvent-detergent (WP 0067, Item 3)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0021

Equipment Condition

TRM drained of fuel and all hoses drained and evacuated (WP 0021)

WARNING

- No operator or field level maintenance personnel are authorized inside tank.
- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

NOTE

The following procedure should be followed when placing the TRM in long-term storage. Under usual conditions, completely draining the TRM (WP 0021) is sufficient for air or rail transport. If complete purging is required in order to repair, clean, paint, store, change material, or ship the TRM, the following procedures shall be used.

PURGING

Chemical Method

1. Close or seal all valve and drain points (WP 0004).

WARNING

- To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover.
- Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly.
- Eye protection is required when opening manhole cover.
- Failure to comply could result in injury or death to personnel.

2. Push down on manhole cover, release latch, and slowly open manhole cover to gradually release any pressure.
3. Fill tank with cold water and allow to overflow for five minutes or until traces of flammable material are removed.
4. Drain tank completely (WP 0021).

WARNING

Solvent-detergent cleaning compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply my cause injury or death to personnel.

CAUTION

Insufficient amount of solvent-detergent cleaning compound will result in an incomplete purging. Once purging has begun, do not stop until process is complete.

5. Add to tank approximately 8 gal. (30.29 L) of solvent-detergent cleaning compound.
6. Fill tank to top with water. Do not overflow.
7. Close manhole cover.
8. Agitate solution with water inside tank (i.e., drive around for a minimum of 40 minutes).
9. Open manhole cover.
10. Drain tank of all solution as quickly as possible by opening all valves and drain points (WP 0021).
11. Fill tank with cold water and allow to overflow for 5 minutes or until water is clear.
12. Drain tank completely and as quickly as possible by opening all valves and drain points (WP 0021).
13. Close manhole cover.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

OPERATION UNDER USUAL CONDITIONS
SHUT DOWN TRM

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Personnel Required

Two

References

ATP 4-43
FM 10-67-1
WP 0004
WP 0006
WP 0015
WP 0060

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- Follow fuel operations in FM 10-67-1 and ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on tank.
- Failure to comply could result in injury or death to personnel.

SHUT DOWN TRM PROCEDURES

1. Stop fueling operations.
2. Evacuate hoses (WP 0015).
3. Close all valves (V1-V16) and manhole cover (WP 0004).
4. Disconnect hoses and install dust caps and plugs on adapters, hoses, and ports (WP 0004).
5. Disconnect power (WP 0006).
6. Perform (AFTER) PMCS (WP 0060).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATION UNDER UNUSUAL CONDITIONS
EXTREME ENVIRONMENT/WEATHER

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Personnel Required

Two

References

ATTP 3-97.11

References - Continued

MIL-STD-3004D
TM 4-33.31
WP 0030
WP 0032
WP 0060

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available.
- When operating the TRM in temperatures of 100ºF (38ºC) or higher, take extra care to minimize the possibility of an explosion and fire.
- Fuels evaporate very quickly. Fuel contact of skin can quickly lower the temperature of exposed skin making the area susceptible to frostbite. Prevent leakage of fuel onto bare skin of personnel.
- When operating the TRM in temperatures down to -25ºF (-31ºC), take extra care to minimize the possibility of frostbite to personnel.
- Failure to comply could result in injury or death to personnel.

CAUTION

The TRM is designed to operate normally within a wide range of climatic conditions. However, some extreme conditions require special operating and servicing procedures to prevent damage to the equipment.

NOTE

Fuel flow will be reduced from 19.69 GPM (17.53 LPM) at 32ºF (0ºC) to 18.04 GPM (68.29 LPM) at -25ºF (-31ºC).

EXTREME ENVIRONMENT/WEATHER

1. Perform the following for operation in extreme heat conditions:

   Clean up fuel spills and drips in a timely manner (WP 0030). The accumulation of evaporating fuel can form dangerous explosive fumes.

2. Perform the following steps for operation in extreme cold conditions:
   a. Remove any fuel from exposed skin as soon as possible.
   b. Remove all snow and ice from TRM as soon as possible.
   c. Perform (BEFORE, DURING, and AFTER) PMCS procedures (WP 0060) as needed.
   d. Prepare TRM for severe cold weather as prescribed in TM 4-33.31. Refer to ATTP 3-97.11 for additional information on operating the TRM in cold weather.
3. Perform the following steps for operation in sandy or dusty conditions:
   a. Ensure the insides of all TRM components are clean before connecting components during setup or assembly.
   b. Clean areas of dust and sand accumulation daily. Perform required operator troubleshooting procedures (WP 0032) if loose connections or leaks occur.
   c. Inspect often per MIL-STD-3004D, Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products, for fuel contamination.
   d. Ensure all fitting, hose, and piping connections are secure.

CAUTION

Accumulation of salt can cause corrosion and damage to equipment.

4. Perform the following steps for operation in salt air and sea spray conditions:
   a. Clean all exposed surfaces frequently.
   b. Rinse all exposed surfaces with fresh water to remove salt.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATION UNDER UNUSUAL CONDITIONS
CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) DECONTAMINATION

INITIAL SETUP

Personnel Required	References
Two	FM 3-11.4
	FM 3-11.5

WARNING

In the event equipment has been exposed to chemical, biological, radiological, and nuclear decontamination warfare, the equipment shall be handled with extreme caution and decontaminated in accordance with FM 3-11.5, NBC Decontamination. Unprotected personnel can experience injury or death if residual toxic agents or radioactive materials are present. If equipment is exposed to radioactive, biological, or chemical agents, personnel must wear protective mask, hood, protective overgarments, chemical gloves, and chemical boots in accordance with Mission Oriented Protective Posture (MOPP) level prescribed by the Officer In Charge (OIC) or Non-Commissioned Officer In Charge (NCOIC). MOPP analysis and levels are described in detail in FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for NBC Protection. Personnel should contact a unit that has capability for freshwater washdown. The unit can also assist in the evacuation of soldiers who have been exposed and provide space and shelter for exchanging MOPP suits. Failure to comply could result in injury or death to personnel.

INTERIM CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) DECONTAMINATION PROCEDURES

1. Decontaminate equipment per FM 3-11.5.
2. Perform operational check of all equipment after decontamination.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

EMERGENCY PROCEDURES – IMMEDIATE ACTIONS

Emergency Procedures - Fire, Immediate Action for Fuel Leaking During Operation, Emergency Procedures - Fuel Spill Containment and Cleanup

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Kit, fuel spill control (WP 0066, Table 1, Item 9)

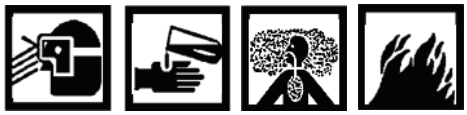
Personnel Required

Two

References

AR 200-1
WP 0004

WARNING



Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply could result in injury or death to personnel.

EMERGENCY PROCEDURES - FIRE

1. Pull closest EMERGENCY STOP handle on TRM (WP 0004).
2. Activate and employ fire extinguishers (WP 0004).
3. Shut down the fuel pump assembly and external transfer pump if possible.
4. Close all valves (V1-V16) (WP 0004) if possible.
5. Check TRM for damage after the fire is extinguished.
6. Contact Field Maintenance for replacement of any components that are damaged by fire.
7. Clean up fuel spills and dispose of contaminated fuel per AR 200-1, Environmental Protection and Enhancement, and local SOP.

END OF TASK

IMMEDIATE ACTION FOR FUEL LEAKING DURING OPERATION

WARNING

Fuel under pressure has sufficient force to penetrate the skin, causing serious injury to personnel. Do not approach the leak until all pressure is removed from the system.

1. Pull closest EMERGENCY STOP handle on TRM (WP 0004).
2. Close valves on both sides of fuel leak when pressure is relieved.
3. Contact Field Maintenance to repair or replace damaged components, as required.

END OF TASK

EMERGENCY PROCEDURES - FUEL SPILL CONTAINMENT AND CLEANUP

NOTE

The following information and instruction is general guidance for fuel spill containment and cleanup actions. Specific requirements and guidance is provided in the unit's Spill Prevention, Control, and Countermeasures (SPCC) plan. The SPCC plan establishes procedures, methods, equipment, and other criteria to prevent fuel spills, and the conduct of spill cleanup.

1. AR 200-1 prescribes Department of the Army (DA) responsibilities, policies and procedures to preserve, protect and restore the quality of the environment. It incorporates all applicable statutory and regulatory requirements in the area of hazardous substances spill contingency planning, control and emergency response, solid and hazardous waste management and environmental restoration for Class III operations. Management of fuel spills, use of the fuel spill control kit, disposal of contaminated kit material and the restoration of the environment after a spill are the responsibility of the installation, activity and unit commander in consultation with AR 200-1 and environmental authorities.
2. Report every spill reported by Class III point operators, no matter how small, and investigate in accordance with AR 200-1 so that the cause can be determined and future spills prevented. Every spill should be treated as a potential source of soil contamination and fire. Cleanup procedures are described below.

   Detailed instructions must be given by the responsible environmental authority. Each spill must be treated as an individual case because of size, type of fuel involved, wind conditions, weather, equipment available, possible involvement of vehicles and other similar variables.

EMERGENCY PROCEDURES - FUEL SPILL CONTAINMENT AND CLEANUP – CONTINUED

NOTE

Fuel spills are classified by the area covered by the spill. The seriousness of a fuel spill is determined by the area of contact between the fuel, soil and air. It is on or above the surface that a flammable, vapor-air mixture can form and fire can take place. The number of square feet covered by the spill is more important than the amount of fuel spilled.

3. Start immediate cleanup. A quick cleanup slows down the spread of contamination and saves on cleanup costs. Absorb spilled fuel or allow it to evaporate before using the spill area for operation. In general, the following are basic actions that should be considered and carried out if spills occur:
   a. Determine the size of the fuel spill.
      (1) A small priming spill is one that covers an area less than 18 in. (45.7 cm) in diameter.
      (2) A small spill is one that is less than 10 ft (3.05 m) in diameter or that covers less than 50 sq-ft (4.65 sq-m). It is not a continuous spill (tank leak).
      (3) A large spill is one that is larger than 10 ft (3.05 m) in diameter, one that covers an area larger than 50 sq-ft (4.65 sq-m) or one that is continuous (a tank leak).
4. Perform the following actions for all fuel spills.
   a. Stop the flow of fuel, if possible. Examples of stopping a spill include shutting off the valves in a hose line and closing secondary containment valves around storage tanks.
   b. Contain the spill. Examples of containing a spill include constructing berms and cut-off trenches and using the fuel spill control kit's enclosed oil absorbents. Do not contain gasoline or other volatile chemical spills. Instead, disperse the volatile fuel away from equipment and let it evaporate.
   c. Evacuate personnel from vehicle involved.
   d. Shut down operations in the area of large spills.
   e. Notify firefighting and environmental support activities.
   f. Check thoroughly for vapors trapped in equipment used in the Class III fuel point operations, such as pump assemblies, filter-separators and fuel tank vehicles. Ensure vapors have dissipated before the equipment and vehicles are returned to service.
   g. Start immediate cleanup.
   h. Use the fuel spill control kit's bag of granular absorbent to spread over small priming fuel spills.
   i. Position a fireguard beside the spill area with a fire extinguisher until the cleanup operation is completed.
5. Perform the following actions for small fuel spills.
   a. Stop operation at the spill site and post a fireguard with a fire extinguisher by the spill.
   b. Use the fuel spill control kit's 10 ft (3.05 m) long enclosed oil absorbents, which are filled with loose absorbent material, to contain the spill by forming a dike around it.
6. Perform the following actions for large fuel spills.

   Call the firefighters immediately and stop operations in the area when at a permanent installation or large temporary refueling point where there is a fire department or fire brigade. As soon as fire assistance has been called, the actions described below should be performed as necessary.
   a. Blanket all MOGAS or JP-4 large spills with fire extinguisher foam as soon as possible to reduce danger of fire or to put out the fire if one exists.
   b. Have all personnel leave the vehicle, if necessary, if the spill is at or near vehicle. No one other than authorized personnel should move throughout the spill area. Any person whose clothes come in contact with fuel should remove contaminated clothing and wash it with soap and water. Any person whose clothes are on fire should roll or be rolled on the ground to put out the fire or be wrapped in a blanket to smother the flames.

EMERGENCY PROCEDURES - FUEL SPILL CONTAINMENT AND CLEANUP – CONTINUED

c. Mobile refueling equipment may be the largest single source of fuel near the spill. If the fuel spill has not caught fire, starting the engine of a refueler or other vehicle could supply a spark that would ignite the spill or vapors. The decision on what procedure is least hazardous – driving the refueler away or not starting the engine – must be made on the spot by the person in charge. If the vehicle engine is running, normal practice is to drive the vehicle away from the spill unless driving away would pose an unacceptable risk to the driver.

d. If an aircraft in the spill area has its engine running at the time of the spill, normally it should lift off out of the spill area. The heat of the engines can cause the spill to ignite. The rotor or prop wash from an aircraft can spread the vapor hazard to an area where ignition sources may be present, thus increasing the danger. It can also cause the problem of dissipating firefighting agents.

7. Clean up small priming fuel spills.
   a. Post a fireguard by the spill area with a fire extinguisher until the cleanup operation is completed.
   b. Use the fuel spill control kit's bag of granular absorbent to spread over the spill.
   c. Dig up the absorbent and contaminated soil using the two-piece nonsparking shovel and place the absorbent and soil into plastic disposal bags.
   d. Use tie strips to seal the bags. Store and transport the bags in a 55 gal. (208.2 L) drum marked with the "Hazardous Material" caution plate.
8. Clean up small fuel spills.
   a. Post a fireguard by the spill area with a fire extinguisher until the cleanup operation is completed.
   b. Use the fuel spill control kit's 15 in. x 20 in. (37.1 cm x 50.8 cm) absorbent pads to absorb the fuel if necessary.
   c. If low flash point fuel, such as JP-4, has been spilled, dig up the contaminated soil using a nonsparking shovel and place into plastic disposal bags.
   d. Use tie strips to seal the bags. Store and transport the bags in 55 gal. (208.2 L) drums marked with the "Hazardous Material" caution plate.
9. Clean up large fuel spills.
   a. At a permanent installation or large temporary refueling point where there is a fire department or fire brigade, firefighters must be standing by and operations stopped in the area.
   b. After the immediate emergency is over, go to the unit's appropriate response plan document prepared per AR 200-1 for instructions on whom to call.
   c. Until cleanup help arrives, it may be best to rope off the area, post a guard, close down nearby refueling operations and allow the spill to evaporate.
   d. The spill area should not be used for operations again until it is free of fuel vapors.

END OF TASK

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

STOWAGE, DECALS, DATA PLATES, AND STENCILS GUIDE

INTRODUCTION

1. This work package provides the stowage location of the COEI and BII.
2. The KEY in Tables 1 and 2 refers to Figure 1.
3. This work package also shows the location of the decals, data plates, and stencils. Refer to Figures 2 through 13.

COEI AND BII STOWAGE LOCATION

Table 1. COEI Stowage Location.

KEY	NOMENCLATURE	QTY	STOWAGE LOCATION
1	CABLE ASSEMBLY, SLAVE, 40 ft	1	In bottom shelf of cable stowage box on right side of TRM
2	CABLE ASSEMBLY, NATO	1	In top shelf of cable stowage box on right side of TRM
3	CABLE ASSEMBLY, PUMP CONTROL	1	In top shelf of cable stowage box on right side of TRM
4	SWITCH BOX ASSEMBLY, REMOTE CONTROL	1	In top shelf of cable stowage box on right side of TRM
5	CABLE ASSEMBLY, GENSET	1	In top shelf of cable stowage box on right side of TRM
6	TRANSPORTER COVER WITH RETAINING STRAP	1	On right side of TRM frame

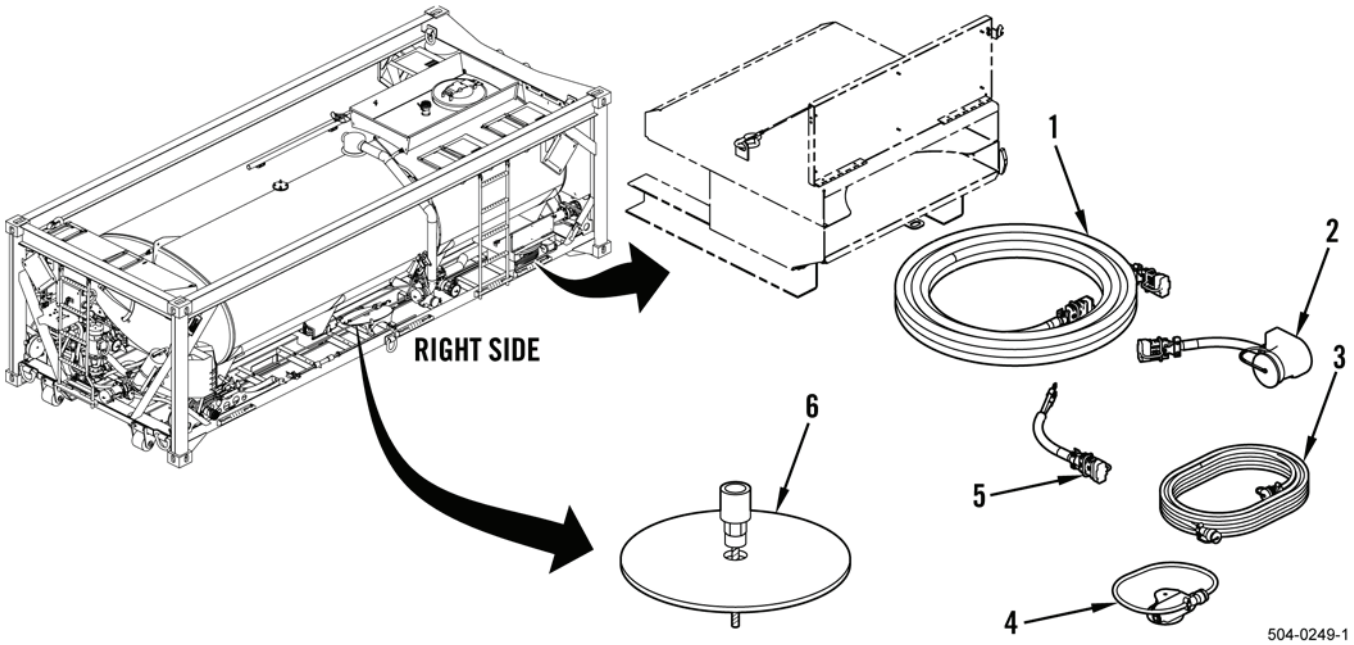


Figure 1. COEI and BII Stowage Location (Sheet 1 of 2).

COEI AND BII STOWAGE LOCATION - CONTINUED

Table 1. COEI Stowage Location. - Continued

KEY	NOMENCLATURE	QTY	STOWAGE LOCATION
7	TROUGH ASSEMBLY	1	On left side of TRM
8	HOSE, DISCHARGE: 2 in. x 13 ft (5.08 cm x 3.96 m)	2	In trough assembly on left side of TRM
9	HOSE, SUCTION: 4 in. x 6 ft (10.16 cm x 1.9 m)	1	In trough assembly on left side of TRM
10	TEE ASSEMBLY WITH RETAINING STRAP	1	At left-rear of TRM, mounted on bracket
11	HOSE, SUCTION: 4 in. x 8 ft (10.16 cm x 2.4 m)	1	In trough assembly on left side of TRM
12	HOSE, SUCTION: 4 in. x 15 ft (10.16 cm x 4.6 m)	2	In trough assembly on left side of TRM
13	FIRE EXTINGUISHER, DRY CHEMICAL (Hand Portable)	2	One at left-front of TRM; one at right-rear of TRM; each mounted on bracket
14	CAMLOCK ADAPTER WITH RETAINING STRAP	1	At right-rear of TRM, mounted on bracket
15	KIT, FUEL SPILL CONTROL	1	At left-front of TRM
16	NOZZLE ASSEMBLY (Open Port)	1	In tool box at right-front of TRM (attach with 24 in. ratchet strap)
17	ON BOARD SPARES	1	In tool box at right-front of TRM
18	HOSE, DISCHARGE: 3 in. x 3.5 ft (7.62 cm x 1.06 m)	1	In tool box at right-front of TRM
19	NATO ADAPTER ASSEMBLY, FEMALE	1	In tool box at right-front of TRM (attach with 1 in. x 24 in. strap)
20	FLANGE ADAPTER ASSEMBLY (D1)	1	In tool box at right-front of TRM (attach with 24 in. ratchet strap)
21	NATO ADAPTER ASSEMBLY, MALE	1	In tool box at right-front of TRM (attach with 1 in. x 24 in. strap)
22	REDUCER, QUICK-DISCONNECT, 3 in. to 4 in. (7.62 cm x 10.06 cm)	1	In tool box at right-front of TRM

Table 2. BII Stowage Location.

KEY	NOMENCLATURE	QTY	STOWAGE LOCATION
23	TECHNICAL MANUAL TM 10-4930-370-10	1	In door of tool box door at right-front of TRM
24	BAG, TOOL	1	In tool box at right-front of TRM
	HAMMER, HAND: soft plastic head	1	In tool bag
	HANDLE, SOCKET WRENCH, 1/2 in. drive	1	In tool bag
	KNIFE, PUTTY: 1-1/4 in. blade	1	In tool bag
	PICK, MINIATURE (SEAL)	1	In tool bag
	PLIERS, SLIP JOINT: 8 in.	1	In tool bag
	SCREWDRIVER, CROSS TIP: #2	1	In tool bag
	SCREWDRIVER, FLAT TIP: 1/4 in.	1	In tool bag
	SOCKET, SOCKET WRENCH, 9/16 in., 1/2 in. drive, deep well	1	In tool bag

COEI AND BII STOWAGE LOCATION - CONTINUED

Table 2. BII Stowage Location. - Continued

KEY	NOMENCLATURE	QTY	STOWAGE LOCATION
	WRENCH, ADJUSTABLE: 12 in.	1	In tool bag
	WRENCH, BOX AND OPEN END: 9/16 in.	1	In tool bag
	WRENCH, BOX AND OPEN END: 1/2 in.	1	In tool bag
25	GAUGE STICK	1	In stowage tube assembly on top of TRM

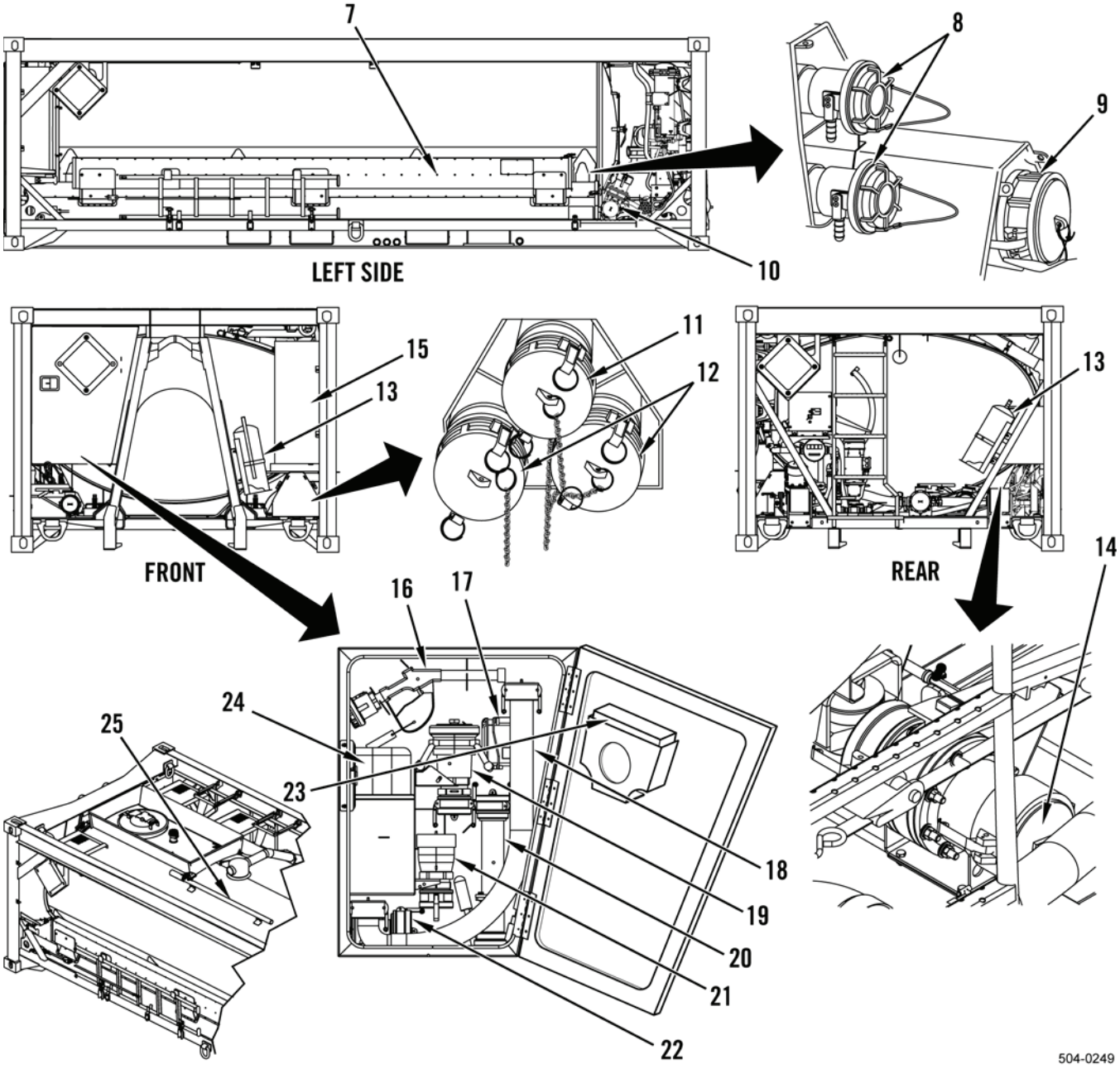


Figure 1. COEI and BII Stowage Location (Sheet 2 of 2).

DECALS

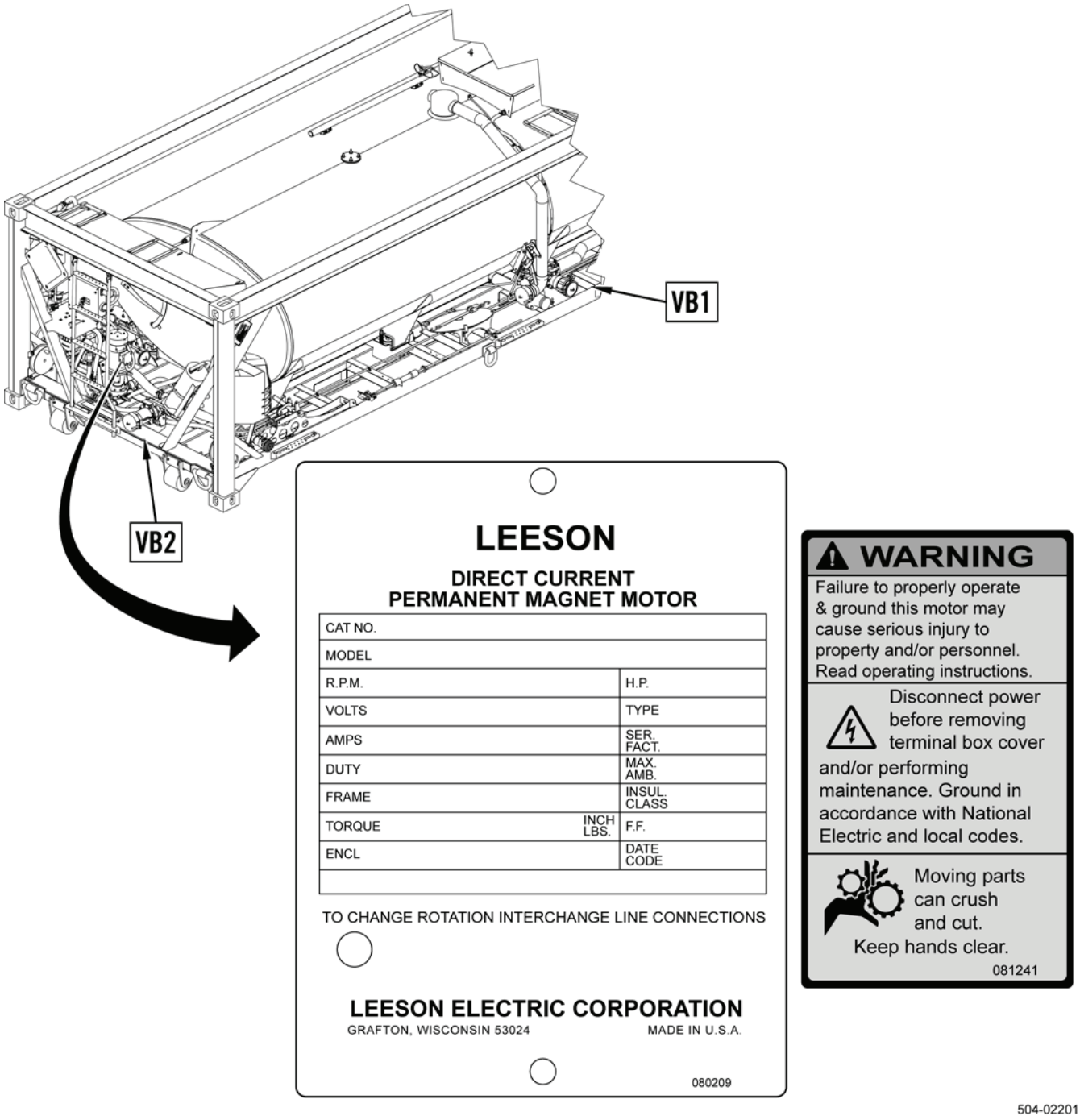


Figure 2. Decals.

DATA PLATES

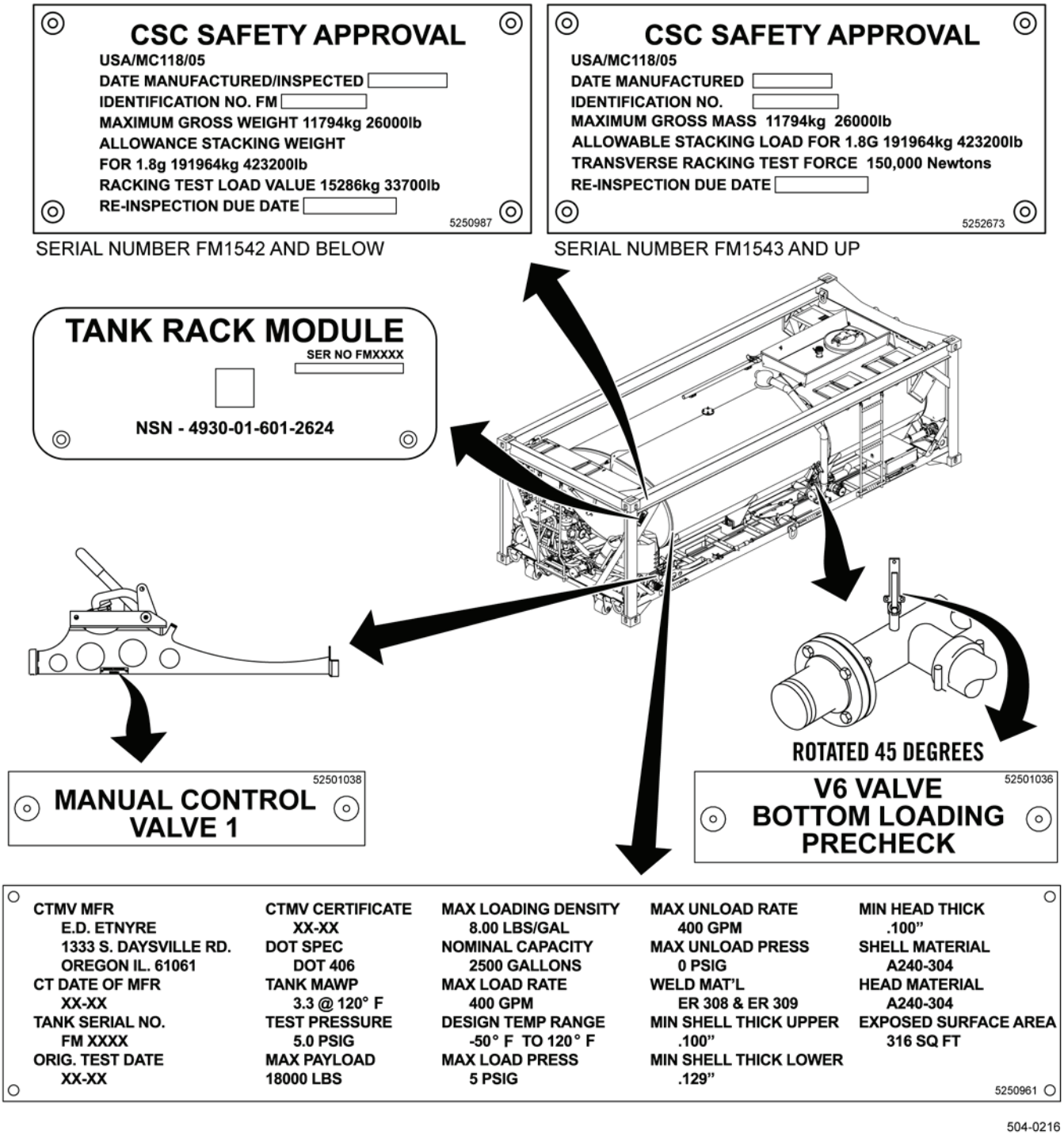
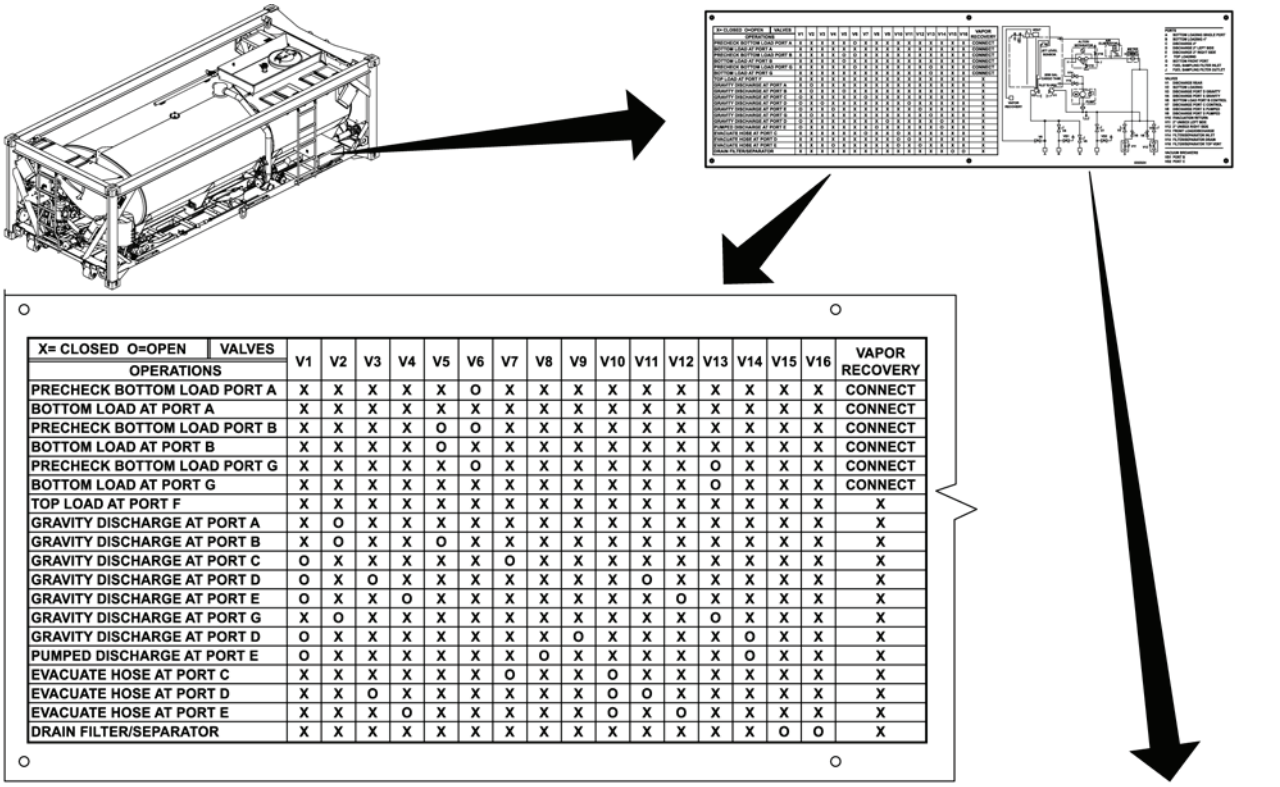
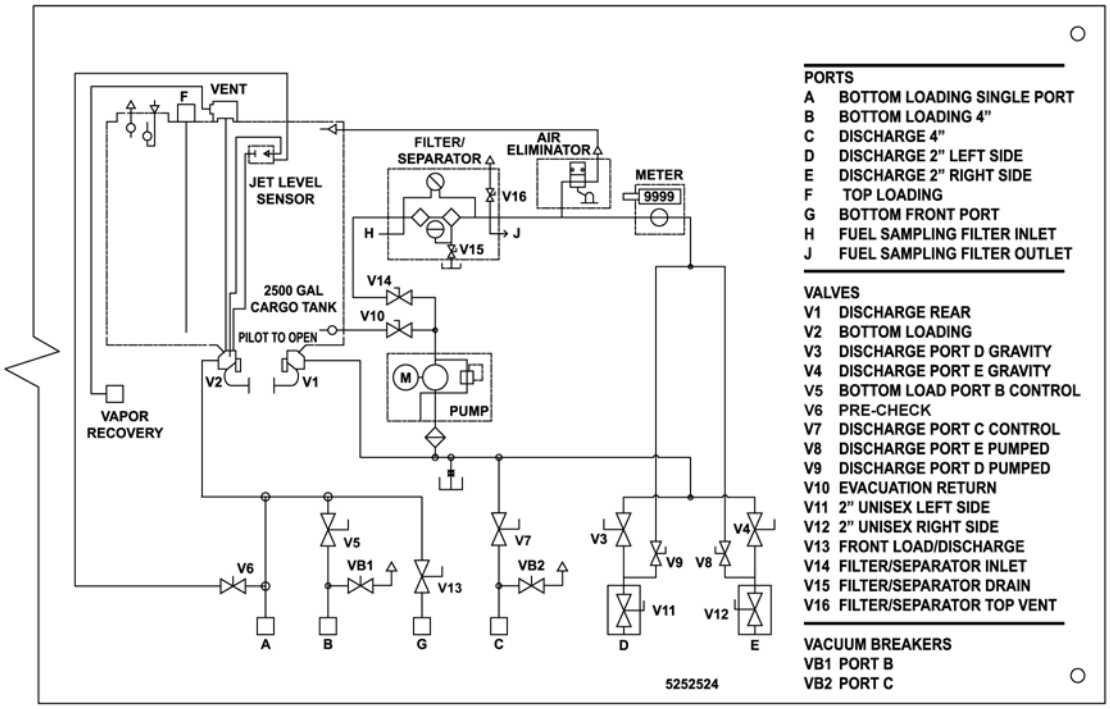


Figure 3. Data Plates, Right Side (Sheet 1 of 2).

DATA PLATES – CONTINUED



X= CLOSED O=OPEN / VALVES / OPERATIONS	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	VAPOR RECOVERY
PRECHECK BOTTOM LOAD PORT A	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	CONNECT
BOTTOM LOAD AT PORT A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	CONNECT
PRECHECK BOTTOM LOAD PORT B	X	X	X	X	O	O	X	X	X	X	X	X	X	X	X	X	CONNECT
BOTTOM LOAD AT PORT B	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	X	CONNECT
PRECHECK BOTTOM LOAD PORT G	X	X	X	X	X	O	X	X	X	X	X	X	O	X	X	X	CONNECT
BOTTOM LOAD AT PORT G	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	CONNECT
TOP LOAD AT PORT F	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRAVITY DISCHARGE AT PORT A	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRAVITY DISCHARGE AT PORT B	X	O	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X
GRAVITY DISCHARGE AT PORT C	O	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X
GRAVITY DISCHARGE AT PORT D	O	X	O	X	X	X	X	X	X	X	O	X	X	X	X	X	X
GRAVITY DISCHARGE AT PORT E	O	X	X	O	X	X	X	X	X	X	X	O	X	X	X	X	X
GRAVITY DISCHARGE AT PORT G	X	O	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X
GRAVITY DISCHARGE AT PORT D	O	X	X	X	X	X	X	X	O	X	X	X	X	O	X	X	X
PUMPED DISCHARGE AT PORT E	O	X	X	X	X	X	X	O	X	X	X	X	X	O	X	X	X
EVACUATE HOSE AT PORT C	X	X	X	X	X	X	O	X	X	O	X	X	X	X	X	X	X
EVACUATE HOSE AT PORT D	X	X	O	X	X	X	X	X	X	O	O	X	X	X	X	X	X
EVACUATE HOSE AT PORT E	X	X	X	O	X	X	X	X	X	O	X	O	X	X	X	X	X
DRAIN FILTER/SEPARATOR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	X



504-0217

Figure 3. Data Plates, Right Side (Sheet 2 of 2).

DATA PLATES – CONTINUED

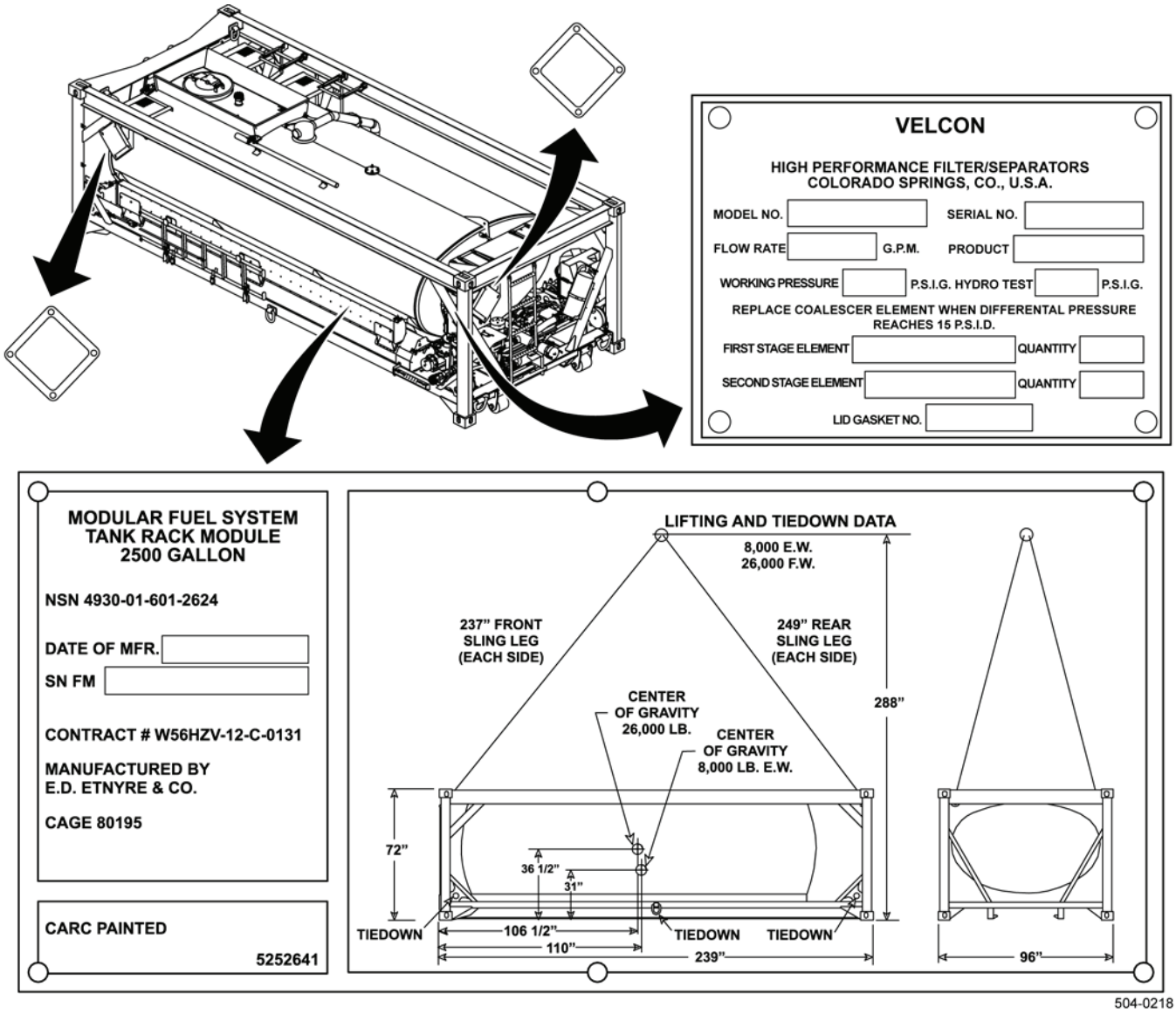


Figure 4. Data Plates, Left Side.

DATA PLATES – CONTINUED

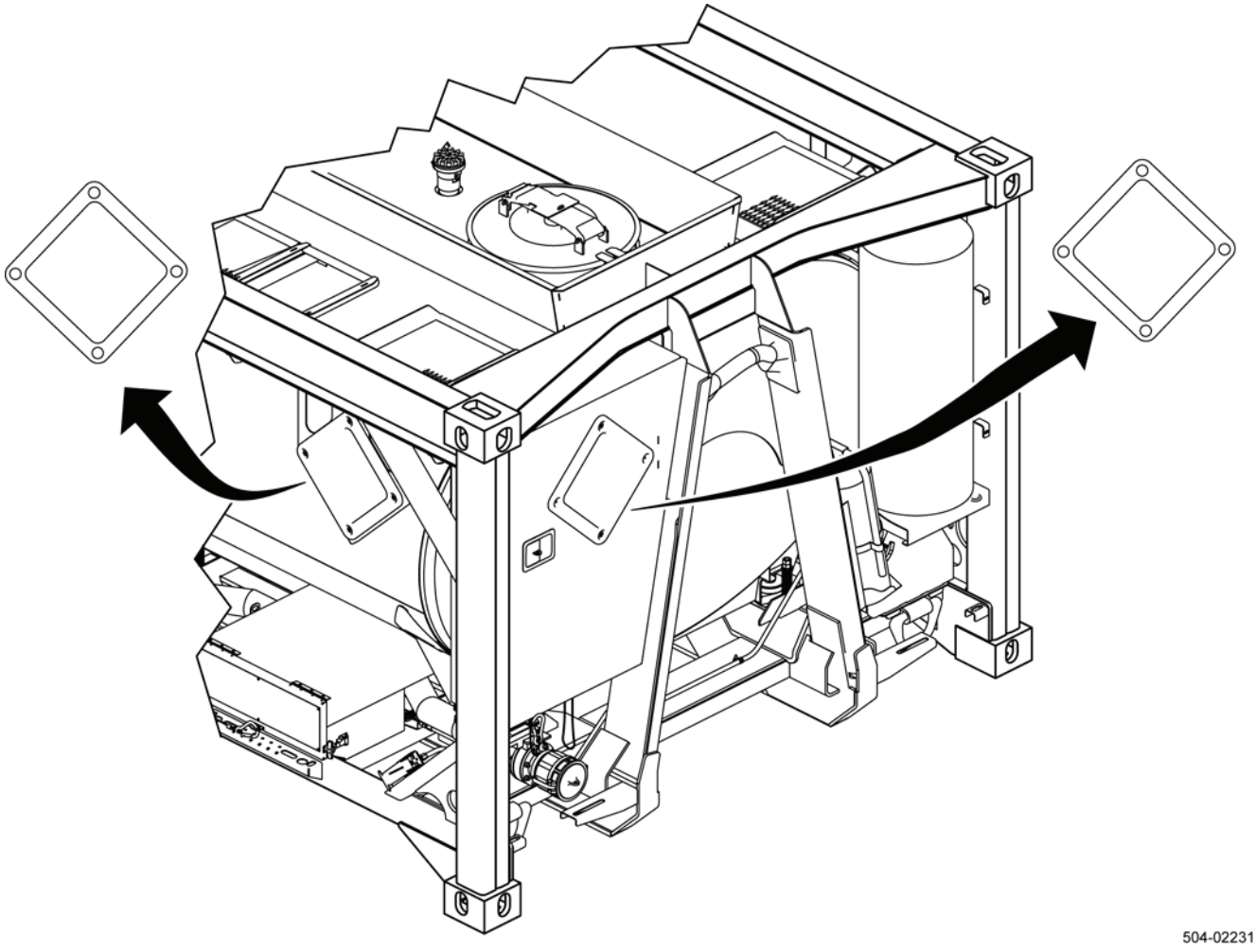


Figure 5. Data Plates, Front.

DATA PLATES – CONTINUED

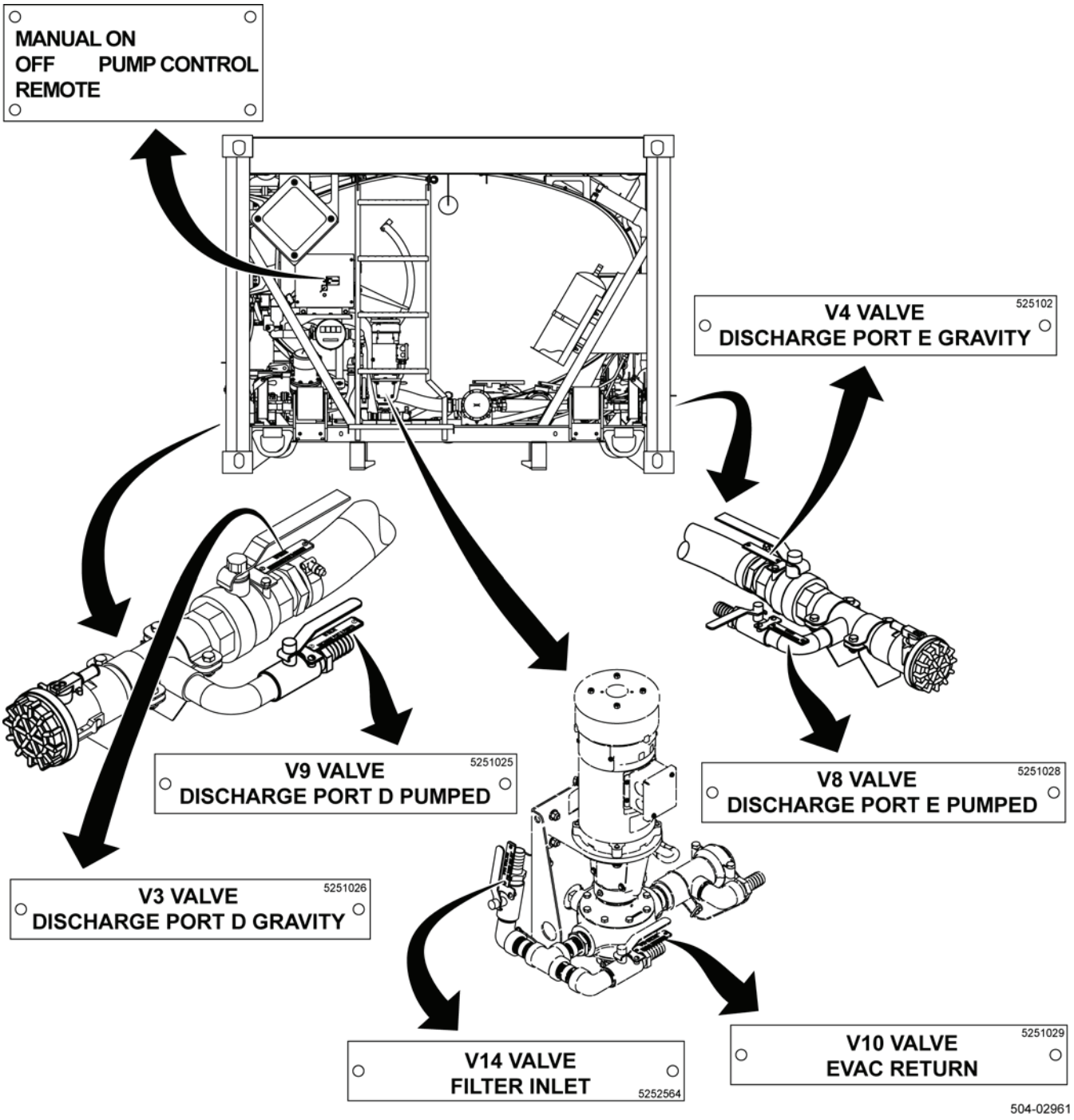


Figure 6. Data Plates, Rear.

STENCILS

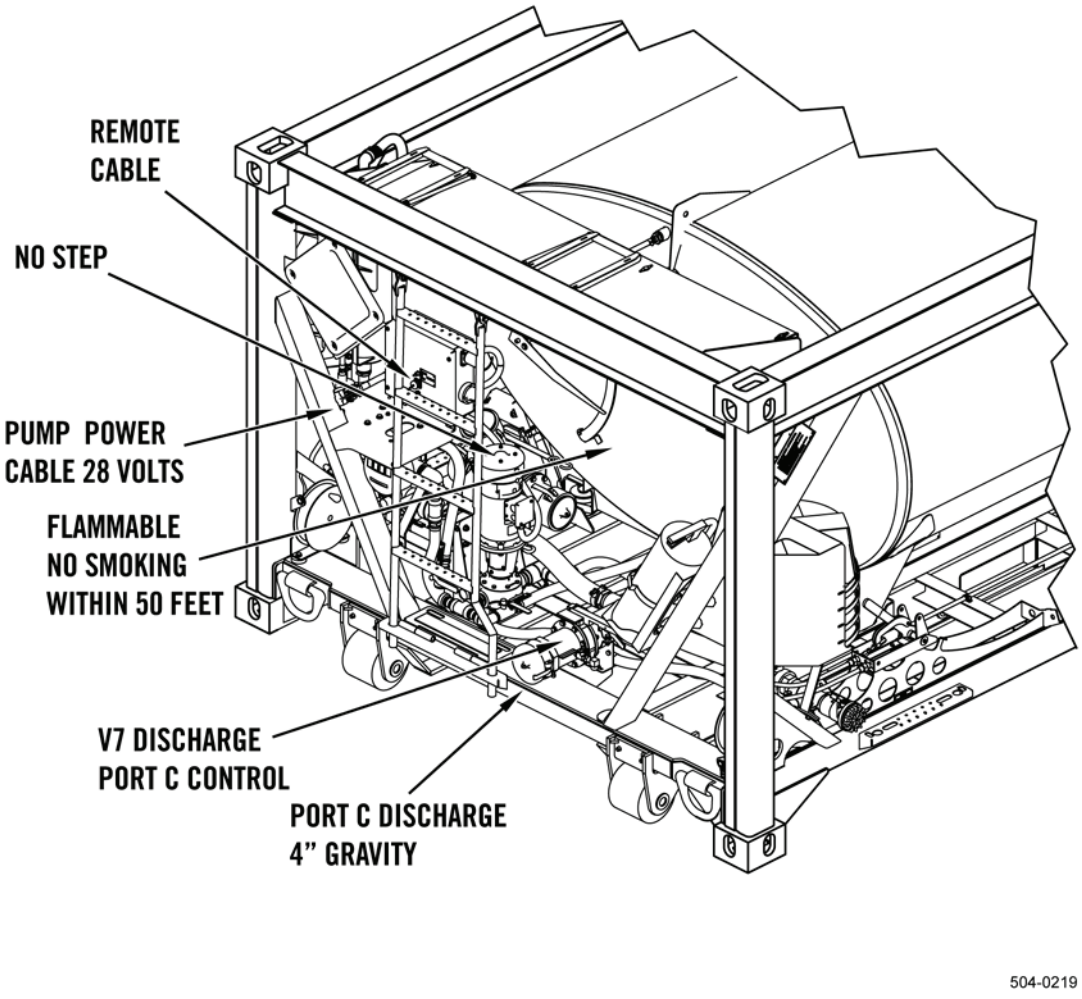


Figure 7. Stencils, Rear.

STENCILS – CONTINUED

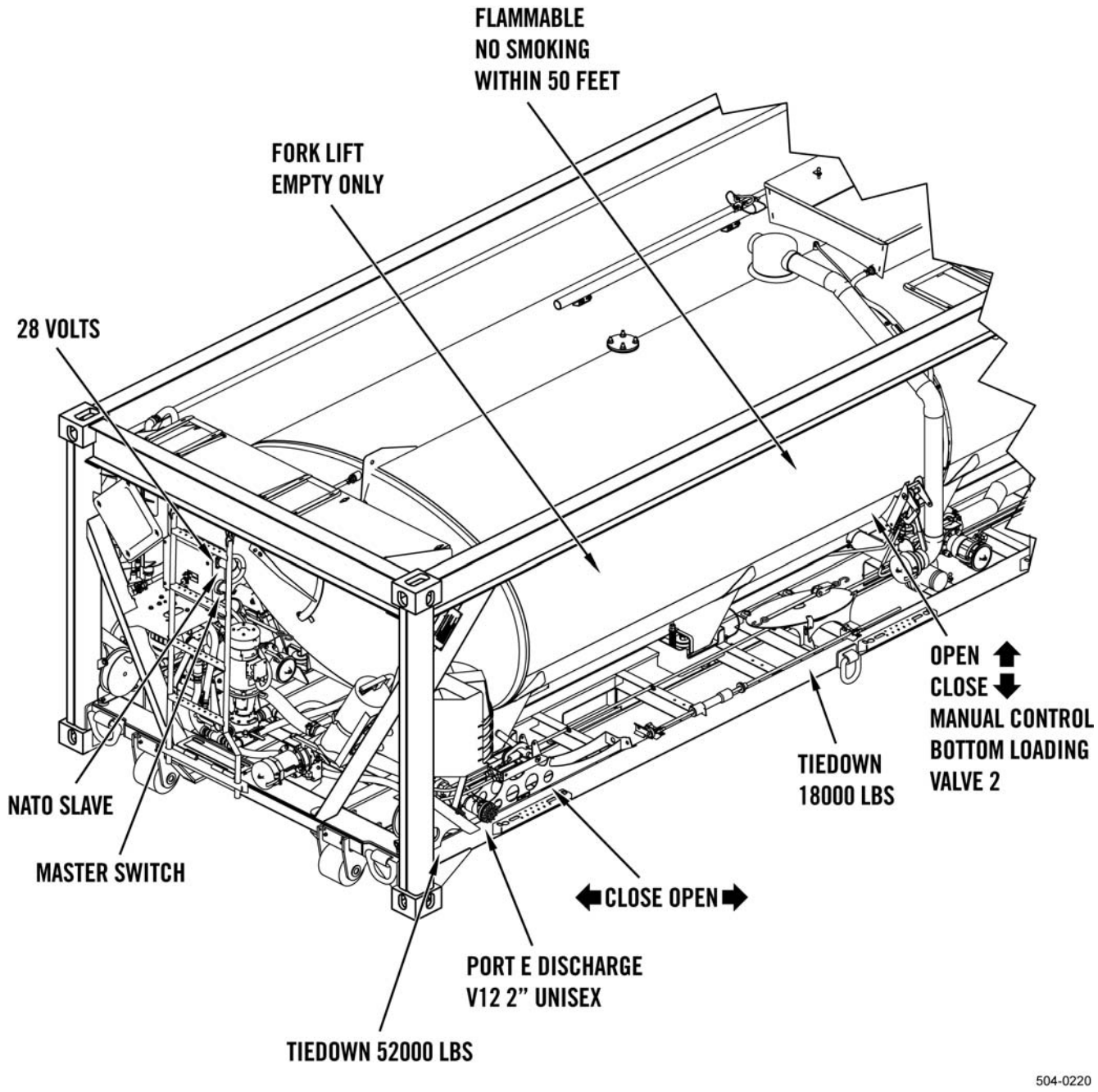


Figure 8. Stencils, Right Side.

STENCILS – CONTINUED

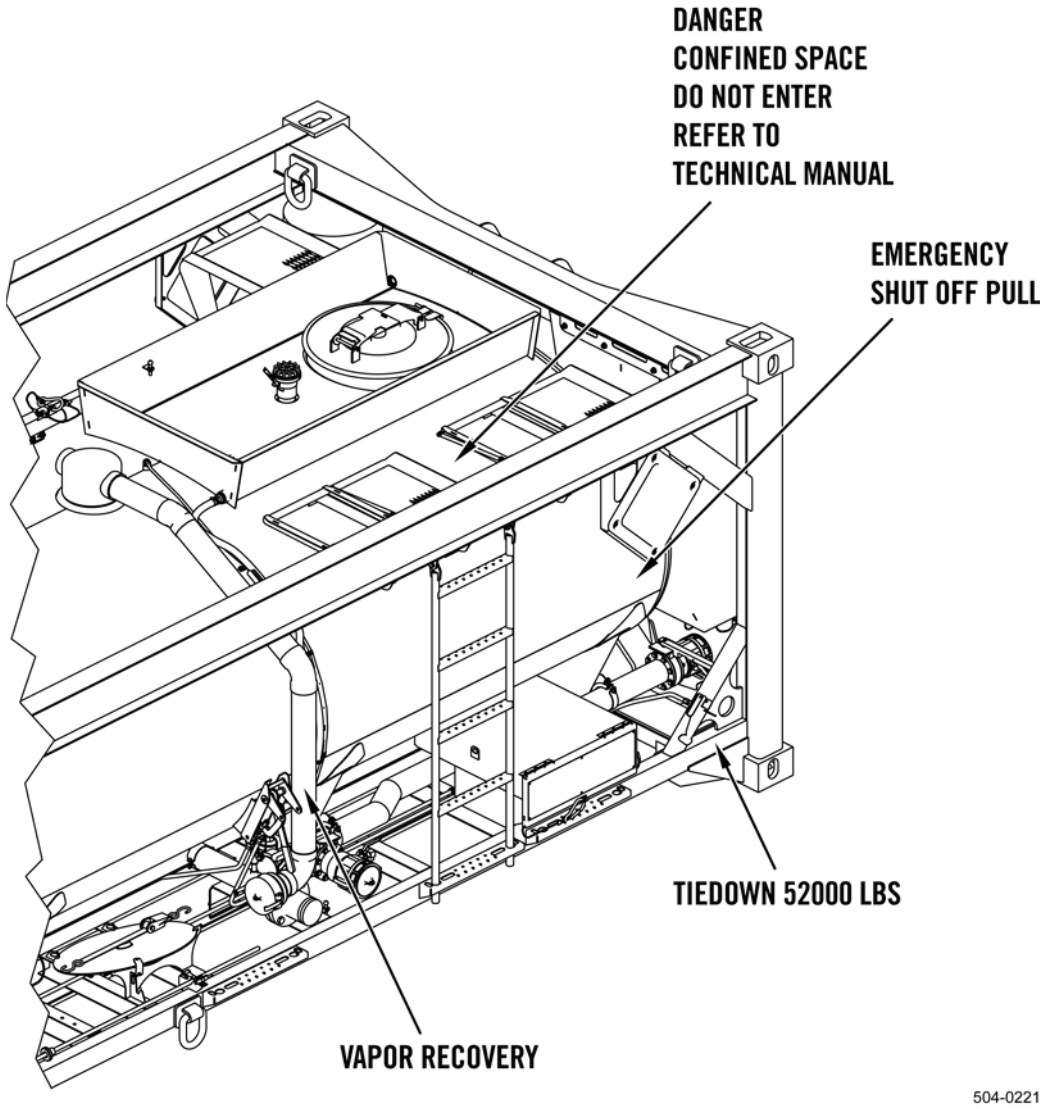


Figure 9. Stencils, Right Front.

STENCILS – CONTINUED

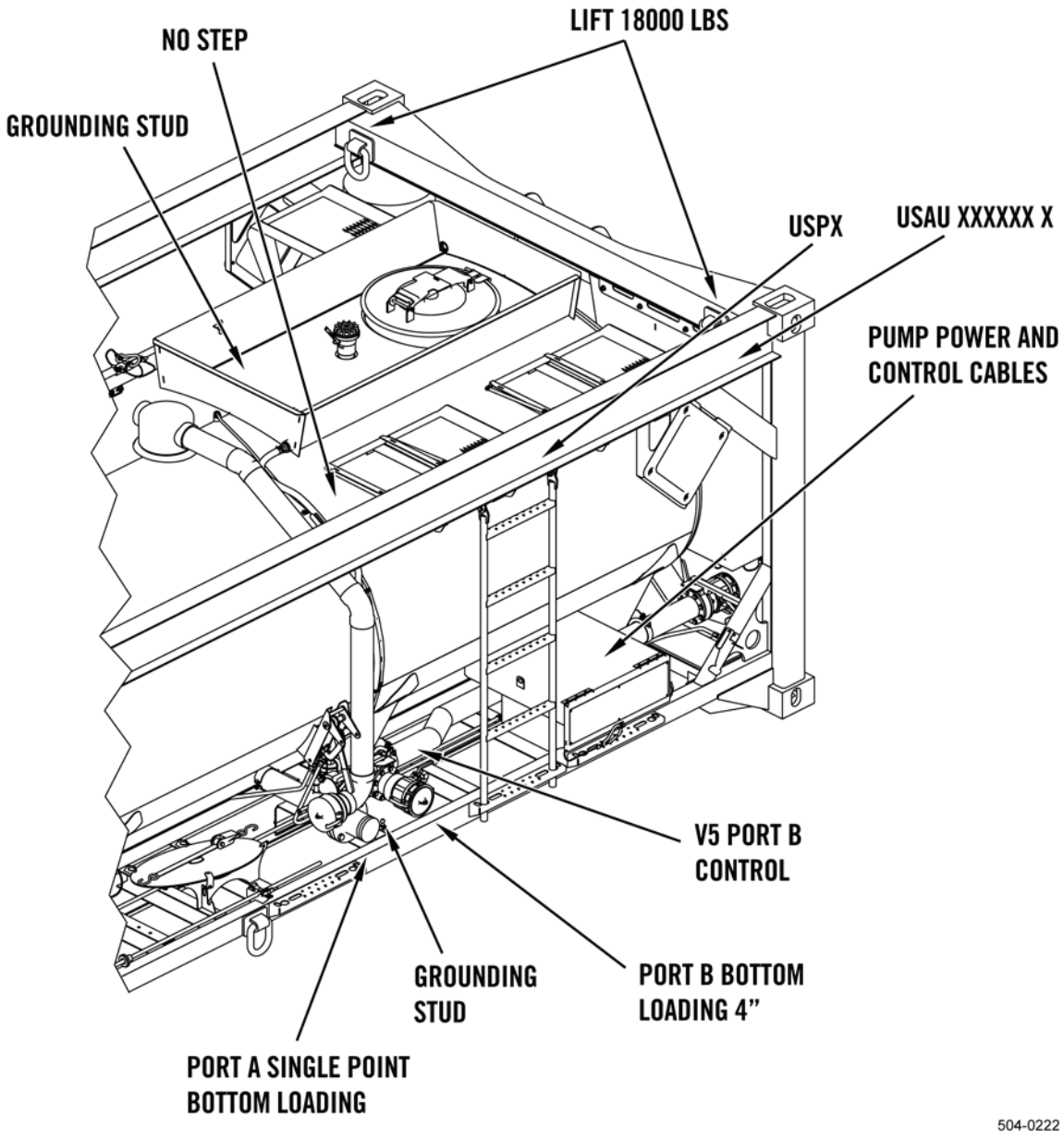


Figure 10. Stencils, Top and Right Side.

STENCILS – CONTINUED

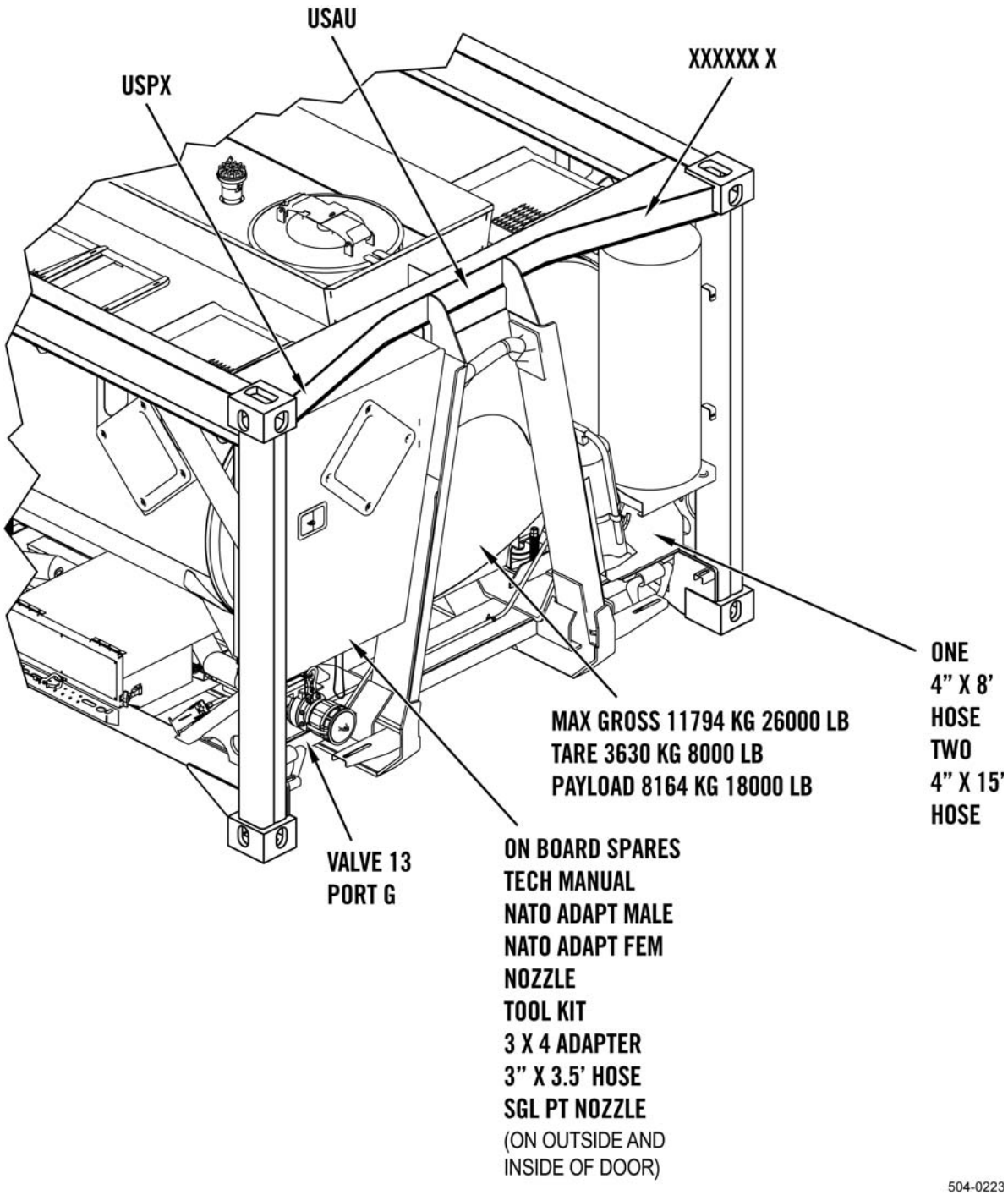


Figure 11. Stencils, Front.

STENCILS – CONTINUED

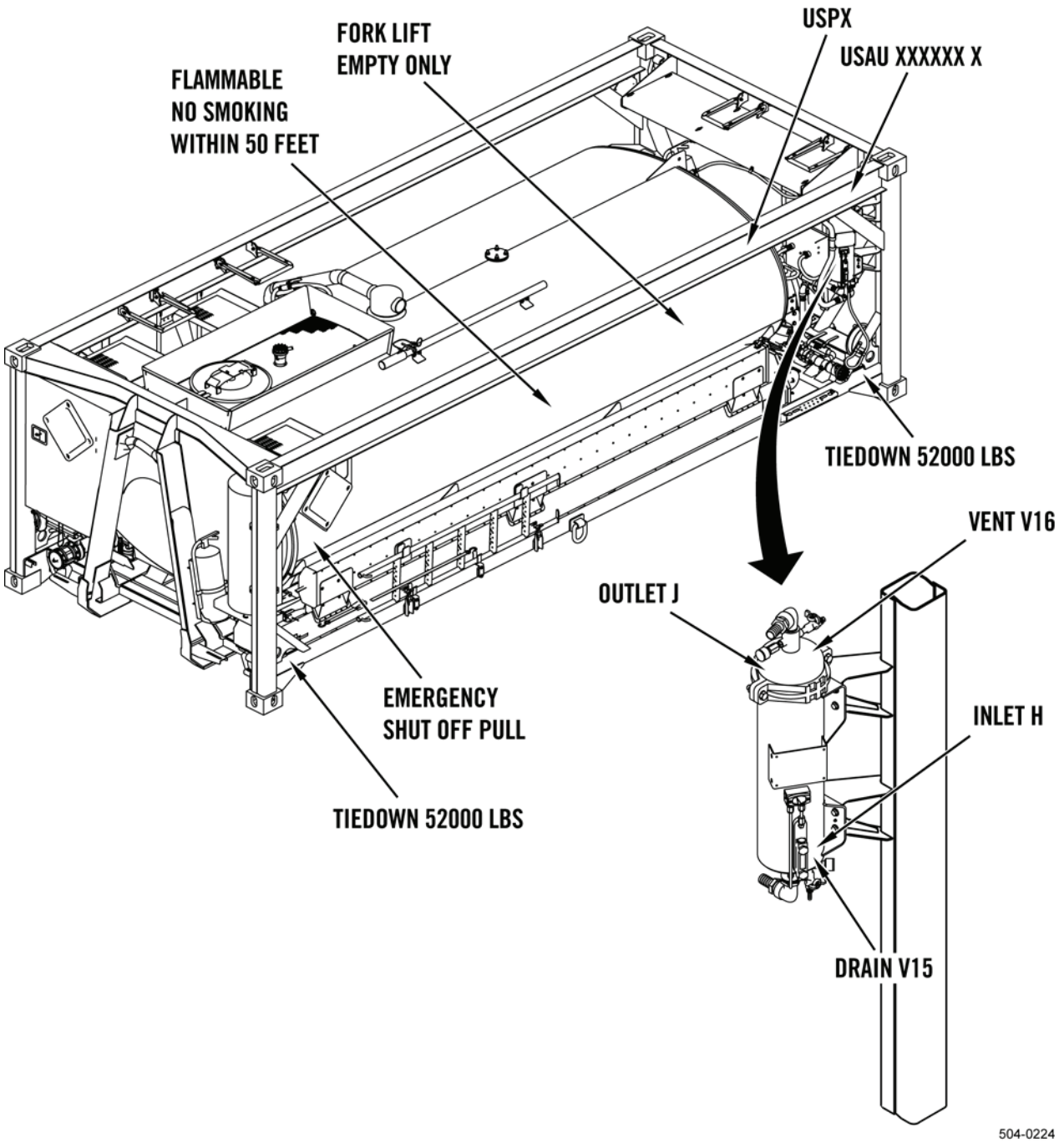


Figure 12. Stencils, Left Side.

STENCILS – CONTINUED

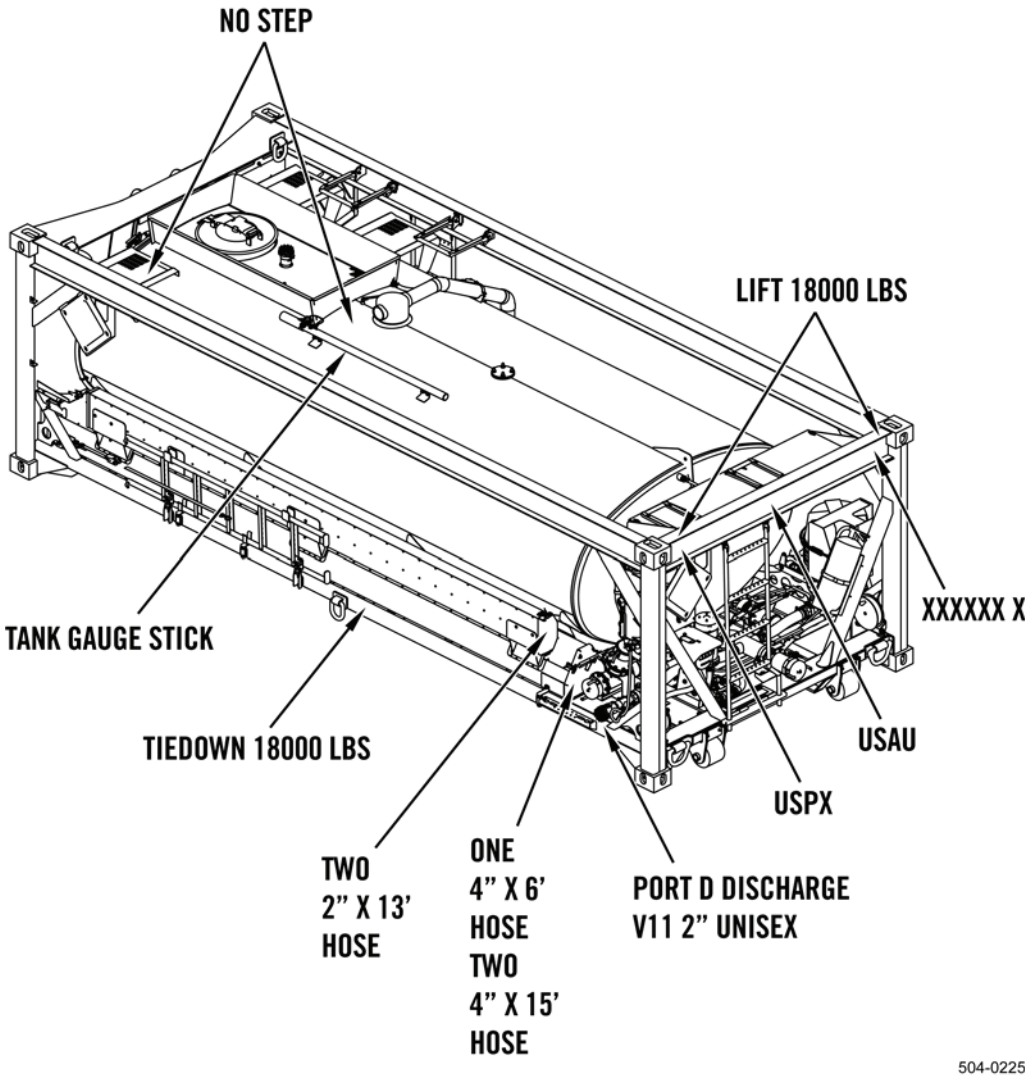


Figure 13. Stencils, Top, Rear, and Left Side.

END OF WORK PACKAGE

CHAPTER 3

OPERATOR TROUBLESHOOTING PROCEDURES

OPERATOR MAINTENANCE

TROUBLESHOOTING INTRODUCTION

NOTE

Review the associated maintenance procedure(s) and determine the amount of disassembly required to perform a test or inspection before beginning a troubleshooting procedure. Disassemble the part only as far as necessary to test/inspect/repair the damaged, broken, or faulty component.

INTRODUCTION

1. This chapter provides information for identifying and correcting symptoms that may develop during operation of the Tank Rack Module (TRM).
2. The Operator Troubleshooting Index (WP 0033) lists common symptoms that may occur and refers to the proper work package in the troubleshooting procedures.
3. If you are unsure of the location of an item mentioned in troubleshooting, refer to General Information (WP 0001), or Equipment Description and Data (WP 0002).
4. Perform (BEFORE) Preventive Maintenance Check and Services (PMCS) (WP 0060) before beginning any troubleshooting procedure.
5. Read and follow all safety instructions found in the Warning Summary at the front of this manual before starting any troubleshooting procedures.
6. The Operator Troubleshooting Index (WP 0033) cannot list all symptoms that may occur, nor can troubleshooting list all tests and corrective actions.

NOTE

This troubleshooting process requires the user to automatically proceed to the next applicable malfunction until the symptom is resolved, provided the corrective action does not correct the malfunction.

7. When troubleshooting, perform the following actions:
   a. Locate the symptom in the Operator Troubleshooting Index (WP 0033) that best describes the symptom.
   b. Turn to the page in the troubleshooting work package(s) which addresses the particular symptom.
   c. Read each step before performing the troubleshooting procedure. Most troubleshooting procedures require isolation and testing of multiple components. To achieve this, the troubleshooting logic procedure is broken down as follows:
      (1) **Symptom.** This is a descriptive statement of the symptom (e.g., Coolant temperature gauge in the red zone). Each symptom is followed by all possible malfunctions.
      (2) **Malfunction.** Each malfunction will be a descriptive statement identifying the malfunction. (e.g., Coolant level low). There may be numerous malfunctions for each symptom. Each malfunction is followed by a corrective action.
      (3) **Corrective Action.** A corrective action may include steps and substeps in order to perform the procedure. If the correction action does not identify a fault, proceed to the next malfunction until all malfunctions have been performed.

      (e.g., Step 1. Turn off engine. Step 2. Allow engine to completely cool. Step 3. Remove radiator cap and verify coolant level is at top of radiator tank. Step a. Fill radiator and inspect coolant hoses for Class III leaks. If leaks are found, tighten clamps or replace coolant hoses.)

END OF WORK PACKAGE

OPERATOR MAINTENANCE

TROUBLESHOOTING INDEX

MALFUNCTION/SYMPTOM	TROUBLESHOOTING PROCEDURE WP
CONNECTION AND LEAK MALFUNCTIONS	
Quick-Disconnect Coupling Assembly Leaks Fuel	WP 0036
Fuel Leaks During Transport	WP 0037
V1 or V2 Valve Leaks Fuel	WP 0038
Precheck Ball Valve (V6) Leaks Fuel	WP 0039
Camlock Adapter Leaks Fuel or Fails to Connect with Other Components	WP 0040
Bottom Load Valve Piping Assembly Leaks Fuel	WP 0041
Inlet/Outlet Piping Butterfly Valve Leaks Fuel	WP 0042
Quick-Disconnect Coupling Half Leaks Fuel	WP 0043
Discharge Piping Assembly Leaks Fuel at Discharge Fuel Hose or Couplings	WP 0045
Discharge Piping Assembly Butterfly Valve (V7) Leaks Fuel at Discharge Piping Assembly Connection	WP 0046
2 in. x 13 ft (5.08 cm x 3.96 m) Discharge Hose Leaks Fuel	WP 0047
Discharge Arm Assembly Leaks Fuel at Discharge Fuel Hose	WP 0048
Left or Right Discharge Arm Leaks Fuel	WP 0049
Discharge/Suction Hose Leaks Fuel or Fails to Connect with Other Components	WP 0050
Tee Assembly Leaks Fuel or Fails to Connect with Other Components	WP 0051
NATO Adapter Leaks Fuel or Fails to Connect with Other Components	WP 0052
Flow Meter Leaks Fuel, or Flow Is Slow, or Does Not Register	WP 0055
Filter/Separator Leaks Fuel	WP 0056
Filter/Separator Differential Pressure Gauge Indicator Is in RED Area	WP 0057
FUEL PUMP MALFUNCTIONS	
Fuel Pump Assembly Does Not Run When Using On/Off EMI Control Box or Remote Control Switch	WP 0053
Fuel Pump Assembly Runs, But No Flow, Runs Slow, Stalls, or Makes Excessive Noise	WP 0054
COMPONENT MALFUNCTIONS	
Static Spark Noted at Fuel Dispensing Nozzle	WP 0034
Fuel Does Not Flow Into Tank	WP 0035
V2 Valve Will Not Open or Close	WP 0044
Low Flow Rate at Discharge Nozzle	WP 0058

END OF WORK PACKAGE

OPERATOR MAINTENANCE

STATIC SPARK NOTED AT FUEL DISPENSING NOZZLE TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

ATP 4-43
FM 10-67-1

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

TROUBLESHOOTING PROCEDURE

STATIC SPARK NOTED AT FUEL DISPENSING NOZZLE

SYMPTOM

Static spark noted at fuel dispensing nozzle.

MALFUNCTION

Nozzle not properly grounded.

CORRECTIVE ACTION

Step 1. Stop fueling operations immediately.

Step 2. Inspect nozzle connection for correct bonding and ground rod for proper connection (FM 10-67-1 and ATP 4-43).

Step 3. Correct bonding/ground.

Step 4. Continue fueling operations.

a. If condition still exists, contact Field Maintenance.

b. If condition does not exist, continue with fueling operations.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL DOES NOT FLOW INTO TANK
TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0020

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

FUEL DOES NOT FLOW INTO TANK

SYMPTOM

Fuel does not flow into tank.

MALFUNCTION

V6 valve open.

CORRECTIVE ACTION

Step 1. Close V6 valve.

Step 2. If V6 valve is already closed, proceed to next malfunction.

MALFUNCTION

Valve closed from fuel source.

CORRECTIVE ACTION

Step 1. Open valve at fuel source.

Step 2. If fuel source valve is already open, proceed to next malfunction.

FUEL DOES NOT FLOW INTO TANK - CONTINUED

MALFUNCTION

Valve closed on TRM.

CORRECTIVE ACTION

Step 1. Open valve on TRM.

Step 2. If TRM valve is already open, proceed to next malfunction.

MALFUNCTION

Tank is over full.

CORRECTIVE ACTION

Step 1. Stop fueling operation.

Step 2. Check fuel level (WP 0020).

a. If tank is over full, contact Field Maintenance.

b. If tank is not over full, proceed to next malfunction.

MALFUNCTION

Inlet piping assembly butterfly valve (V5 or V13) damaged or defective.

CORRECTIVE ACTION

Step 1. If piping assembly butterfly valve (V5 or V13) is damaged or defective, contact Field Maintenance.

Step 2. If piping assembly butterfly valve (V5 or V13) is not damaged or defective, proceed to next malfunction.

MALFUNCTION

V2 valve damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

QUICK-DISCONNECT COUPLING ASSEMBLY LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

QUICK-DISCONNECT COUPLING ASSEMBLY LEAKS FUEL

SYMPTOM

Quick-disconnect coupling assembly leaks fuel at interface.

MALFUNCTION

Quick-disconnect coupling assembly dirty.

CORRECTIVE ACTION

Step 1. Remove components with quick-disconnect coupling halves (WP 0062).

Step 2. Inspect quick-disconnect coupling halves for dirt or debris inside couplings. Remove any dirt or debris found (WP 0062).

Step 3. Install components with quick-disconnect coupling halves (WP 0062).

Step 4. If condition still exists, proceed to next malfunction.

QUICK-DISCONNECT COUPLING ASSEMBLY LEAKS FUEL - CONTINUED

MALFUNCTION

Quick-disconnect coupling assembly seal missing or defective.

CORRECTIVE ACTION

Step 1. Remove components with quick-disconnect coupling halves (WP 0062).

Step 2. Inspect quick-disconnect coupling halves for defective or missing seal. If seal is defective or missing, replace quick-disconnect coupling half seal (WP 0062).

Step 3. Install components with quick-disconnect coupling halves (WP 0062).

Step 4. If condition still exists, proceed to next malfunction.

MALFUNCTION

Quick-disconnect coupling damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL LEAKS DURING TRANSPORT TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS DURING TRANSPORT

SYMPTOM

Fuel leaks during transport.

MALFUNCTION

Defective seals, gaskets, or piping.

CORRECTIVE ACTION

Step 1. If seals, gaskets, or piping are defective, contact Field Maintenance.

Step 2. If seals, gaskets, or piping are not defective, proceed to next malfunction.

MALFUNCTION

Defective vent gasket.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

V1 OR V2 VALVE LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

V1 OR V2 VALVE LEAKS FUEL

SYMPTOM

V1 or V2 valve leaks fuel.

MALFUNCTION

Defective gasket or V1 or V2 valve.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PRECHECK BALL VALVE (V6) LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

PRECHECK BALL VALVE (V6) LEAKS FUEL

SYMPTOM

Precheck ball valve (V6) leaks fuel.

MALFUNCTION

Defective precheck ball valve.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

CAMLOCK ADAPTER LEAKS FUEL OR FAILS TO CONNECT WITH OTHER COMPONENTS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

CAMLOCK ADAPTER LEAKS FUEL

SYMPTOM

Camlock adapter leaks fuel.

MALFUNCTION

Camlock adapter connectors are improperly fastened.

CORRECTIVE ACTION

Step 1. Inspect camlock adapter coupling for dirt or debris trapped inside the camlock adapter connection, and remove any dirt or debris found.

Step 2. Inspect camlock adapter connector for defective or missing gasket. If gasket is defective or missing, replace camlock adapter connector gasket (WP 0062).

Step 3. If condition still exists, contact Field Maintenance.

END OF TASK

CAMLOCK ADAPTER FAILS TO CONNECT WITH OTHER COMPONENTS

SYMPTOM

Camlock adapter fails to connect with other components.

MALFUNCTION

Camlock adapter is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

BOTTOM LOAD VALVE PIPING ASSEMBLY LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

BOTTOM LOAD VALVE PIPING ASSEMBLY LEAKS FUEL

SYMPTOM

Bottom load valve piping assembly leaks fuel.

MALFUNCTION

Damaged quick-disconnect coupling seal.

CORRECTIVE ACTION

Step 1. If quick-disconnect coupling seal is damaged, contact Field Maintenance.

Step 2. If quick-disconnect coupling seal is not damaged, proceed to next malfunction.

MALFUNCTION

Damaged quick-disconnect coupling half.

CORRECTIVE ACTION

Step 1. If quick-disconnect coupling half is damaged, contact Field Maintenance.

Step 2. If quick-disconnect coupling half is not damaged, proceed to next malfunction.

BOTTOM LOAD VALVE PIPING ASSEMBLY LEAKS FUEL - CONTINUED

MALFUNCTION

Damaged inlet piping assembly butterfly valve.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

INLET/OUTLET PIPING BUTTERFLY VALVE LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

INLET/OUTLET PIPING BUTTERFLY VALVE LEAKS FUEL

SYMPTOM

Inlet/outlet piping butterfly valve leaks fuel.

MALFUNCTION

Damaged gaskets.

CORRECTIVE ACTION

Step 1. If gaskets are damaged, contact Field Maintenance.

Step 2. If gaskets are not damaged, proceed to next malfunction.

MALFUNCTION

Damaged butterfly valve.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

QUICK-DISCONNECT COUPLING HALF LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

QUICK-DISCONNECT COUPLING HALF LEAKS FUEL

SYMPTOM

Quick-disconnect coupling half leaks fuel.

MALFUNCTION

Damaged gaskets.

CORRECTIVE ACTION

Step 1. Remove quick-disconnect coupling half (WP 0062).

Step 2. Inspect quick-disconnect coupling half for defective or missing gasket. If gasket is defective or missing, replace quick-disconnect coupling half gasket (WP 0062).

Step 3. Install quick-disconnect coupling half (WP 0062).

Step 4. If condition still exists, proceed to next malfunction.

QUICK-DISCONNECT COUPLING HALF LEAKS FUEL - CONTINUED

MALFUNCTION

Defective adapter assembly.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

V2 VALVE WILL NOT OPEN OR CLOSE TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0020
WP 0025

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

V2 VALVE WILL NOT OPEN OR CLOSE

SYMPTOM

V2 valve will not open or close.

MALFUNCTION

V2 vent valve transport hold-downs installed.

CORRECTIVE ACTION

Step 1. Check V2 vent valve on top of tank for installation of hold-downs and remove hold-downs if installed (WP 0025).

Step 2. If hold-downs are not installed, proceed to next malfunction.

MALFUNCTION

Defective V2 valve.

CORRECTIVE ACTION

Step 1. If V2 valve is defective, contact Field Maintenance.

Step 2. If V2 valve is not defective, contact Field Maintenance.

END OF TASK

V2 VALVE WILL NOT OPEN OR CLOSE AUTOMATICALLY

SYMPTOM

V2 valve will not open or close automatically.

MALFUNCTION

Tank is full.

CORRECTIVE ACTION

Step 1. Stop filling operations.

Step 2. Check fuel level (WP 0020).

Step 3. If tank is full, discontinue filling operations.

Step 4. If tank is not full, proceed to next malfunction.

MALFUNCTION

V6 valve open.

CORRECTIVE ACTION

Step 1. Close V6 valve.

Step 2. If V6 valve is closed, proceed to next malfunction.

MALFUNCTION

V2 valve or liquid level switch is damaged or malfunctioning.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DISCHARGE PIPING ASSEMBLY LEAKS FUEL AT DISCHARGE FUEL HOSE OR COUPLINGS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

DISCHARGE PIPING ASSEMBLY LEAKS FUEL AT DISCHARGE FUEL HOSE

SYMPTOM

Discharge piping assembly leaks fuel at discharge fuel hose.

MALFUNCTION

Discharge fuel hose is loose or improperly installed.

CORRECTIVE ACTION

Step 1. If loose, tighten fittings on discharge fuel hose.

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

Discharge fuel hose is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

DISCHARGE PIPING ASSEMBLY LEAKS FUEL AT COUPLINGS

SYMPTOM

Discharge piping assembly leaks fuel at couplings.

MALFUNCTION

Couplings are loose or improperly installed.

CORRECTIVE ACTION

Step 1. If loose, tighten couplings.

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

Couplings are damaged or defective.

CORRECTIVE ACTION

Step 1. If couplings are damaged or defective, contact Field Maintenance.

Step 2. If couplings are not damaged or defective, proceed to next malfunction.

MALFUNCTION

Discharge piping assembly is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DISCHARGE PIPING ASSEMBLY BUTTERFLY VALVE (V7) LEAKS FUEL AT DISCHARGE PIPING ASSEMBLY CONNECTION
TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

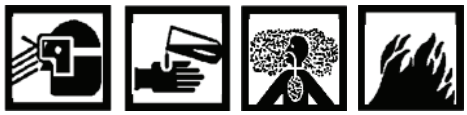
References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING



Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

DISCHARGE PIPING ASSEMBLY BUTTERFLY VALVE (V7) LEAKS FUEL AT DISCHARGE PIPING ASSEMBLY CONNECTION

SYMPTOM

Butterfly valve (V7) leaks fuel at discharge piping assembly connection.

MALFUNCTION

Gasket between discharge piping assembly and butterfly valve is defective or damaged.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

2 IN. X 13 FT (5.08 CM X 3.96 M) DISCHARGE HOSE LEAKS FUEL TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

2 IN. X 13 FT (5.08 CM X 3.96 M) DISCHARGE HOSE LEAKS FUEL

SYMPTOM

2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose leaks fuel.

MALFUNCTION

2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose is loose or improperly installed.

CORRECTIVE ACTION

Step 1. Remove quick-disconnect coupling half (WP 0062).

Step 2. Inspect quick-disconnect coupling half for dirt or debris trapped inside the camlock connections and remove any dirt or debris found.

Step 3. If condition still exists, proceed to next malfunction.

MALFUNCTION

Quick-disconnect coupling half seal damaged or defective.

2 IN. X 13 FT (5.08 CM X 3.96 M) DISCHARGE HOSE LEAKS FUEL - CONTINUED

CORRECTIVE ACTION

Step 1. Inspect quick-disconnect coupling half seals for damage (WP 0062).

Step 2. Inspect quick-disconnect coupling half for defective or missing gasket. If gasket is defective or missing, replace gasket (WP 0062).

Step 3. If condition still exists, proceed to next malfunction.

MALFUNCTION

2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose is defective or damaged.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DISCHARGE ARM ASSEMBLY LEAKS FUEL AT DISCHARGE FUEL HOSE TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

DISCHARGE ARM ASSEMBLY LEAKS FUEL AT DISCHARGE FUEL HOSE

SYMPTOM

Discharge arm assembly leaks fuel at discharge fuel hose.

MALFUNCTION

1 in. (2.54 cm) discharge fuel hose is loose or improperly installed.

CORRECTIVE ACTION

Step 1. If loose, tighten discharge fuel hose connections.

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

1 in. (2.54 cm) discharge fuel hose is damaged or defective.

CORRECTIVE ACTION

Step 1. If 1 in. (2.54 cm) discharge fuel hose is damaged or defective, contact Field Maintenance.

Step 2. If 1 in. (2.54 cm) discharge fuel hose is not damaged or defective, proceed to next malfunction.

DISCHARGE ARM ASSEMBLY LEAKS FUEL AT DISCHARGE FUEL HOSE - CONTINUED

MALFUNCTION

2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose is loose or improperly installed.

CORRECTIVE ACTION

Step 1. If loose, tighten discharge fuel hose connections.

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

LEFT OR RIGHT DISCHARGE ARM LEAKS FUEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

LEFT OR RIGHT DISCHARGE ARM LEAKS FUEL

SYMPTOM

Left or right discharge arm leaks fuel.

MALFUNCTION

Quick-disconnect couplings are loose or improperly installed.

CORRECTIVE ACTION

Step 1. If loose, tighten quick-disconnect couplings.

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

Quick-disconnect couplings are defective or damaged.

CORRECTIVE ACTION

Step 1. If quick-disconnect couplings are defective or damaged, contact Field Maintenance.

Step 2. If quick-disconnect couplings are not defective or damaged, proceed to next malfunction.

LEFT OR RIGHT DISCHARGE ARM LEAKS FUEL - CONTINUED

MALFUNCTION

Discharge arm joints or connections damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DISCHARGE/SUCTION HOSE LEAKS FUEL OR FAILS TO CONNECT WITH OTHER COMPONENTS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

DISCHARGE/SUCTION HOSE LEAKS FUEL

SYMPTOM

Discharge/suction hose leaks fuel.

MALFUNCTION

Camlock connection leaks fuel.

CORRECTIVE ACTION

Step 1. Remove components with camlock connections (WP 0062).

Step 2. Inspect camlock coupling for dirt or debris trapped inside the camlock connections and remove any dirt or debris found.

Step 3. Inspect camlock connector for defective or missing gasket. If gasket is defective or missing, replace camlock connector gasket (WP 0062).

Step 4. Install components with camlock connectors (WP 0062).

Step 5. If condition still exists, contact Field Maintenance.

END OF TASK

DISCHARGE/SUCTION HOSE FAILS TO CONNECT WITH OTHER COMPONENTS

SYMPTOM

Discharge/suction hose fails to connect with other components.

MALFUNCTION

Discharge/suction hose damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

TEE ASSEMBLY LEAKS FUEL OR FAILS TO CONNECT WITH OTHER COMPONENTS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0062

Equipment Condition

TRM prepared for use (WP 0005)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

TEE ASSEMBLY LEAKS FUEL

SYMPTOM

Tee assembly leaks fuel.

MALFUNCTION

Camlock connector damaged or defective.

CORRECTIVE ACTION

Step 1. Remove components with camlock connections (WP 0062).

Step 2. Inspect camlock coupling for dirt or debris trapped inside the camlock connections and remove any dirt or debris found.

Step 3. Inspect camlock connector for defective or missing gasket. If gasket is defective or missing, replace camlock connector gasket (WP 0062).

Step 4. Install components with camlock connectors (WP 0062).

Step 5. If condition still exists, contact Field Maintenance.

END OF TASK

TEE ASSEMBLY FAILS TO CONNECT WITH OTHER COMPONENTS

SYMPTOM

Tee assembly fails to connect with other components.

MALFUNCTION

Tee assembly damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

NATO ADAPTER LEAKS FUEL OR FAILS TO CONNECT WITH OTHER COMPONENTS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

Equipment Condition

TRM prepared for use (WP 0005)

References

WP 0004

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

NATO ADAPTER LEAKS FUEL

SYMPTOM

NATO adapter leaks fuel.

MALFUNCTION

NATO connector contains dirt or debris.

CORRECTIVE ACTION

Step 1. Inspect connector for dirt or debris trapped inside the connector and remove any dirt or debris found.

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

NATO connector is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

NATO ADAPTER FAILS TO CONNECT WITH OTHER COMPONENTS

SYMPTOM

NATO adapter fails to connect with other components.

MALFUNCTION

NATO adapter is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL PUMP ASSEMBLY DOES NOT RUN WHEN USING ON/OFF EMI CONTROL BOX OR REMOTE CONTROL SWITCH TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

FUEL PUMP ASSEMBLY DOES NOT RUN WHEN USING ON/OFF EMI CONTROL BOX SWITCH

SYMPTOM

Fuel pump assembly does not run when using On/Off EMI control box switch.

MALFUNCTION

2A circuit breaker tripped.

CORRECTIVE ACTION

Step 1. Reset 2A circuit breaker on front of EMI control box and continue with fueling operations.

a. If 2A circuit breaker trips again, contact Field Maintenance.
b. If 2A circuit breaker does not trip, but condition still exists, proceed to next malfunction.
c. If condition does not exist, continue with fueling operations.

MALFUNCTION

Master switch on EMI control box not functioning properly.

FUEL PUMP ASSEMBLY DOES NOT RUN WHEN USING ON/OFF EMI CONTROL BOX SWITCH - CONTINUED

CORRECTIVE ACTION

Step 1. Turn master switch from ON to OFF to ON.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Cables not connected correctly.

CORRECTIVE ACTION

Step 1. Ensure cables to EMI control box are connected correctly (WP 0006).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Power source not functioning properly.

CORRECTIVE ACTION

Step 1. Replace power source.

a. If condition still exists, contact Field Maintenance.

b. If condition does not exist, continue with fueling operations.

END OF TASK

FUEL PUMP ASSEMBLY DOES NOT RUN WHEN USING ON/OFF REMOTE CONTROL SWITCH

SYMPTOM

Fuel pump assembly does not run when using On/Off remote control switch.

MALFUNCTION

2A circuit breaker tripped.

CORRECTIVE ACTION

Step 1. Reset 2A circuit breaker on front of EMI control box and continue with fueling operations.

a. If 2A circuit breaker trips again, proceed to next step.

b. If 2A circuit breaker does not trip, but condition still exists, proceed to next malfunction.

c. If condition does not exist, continue with fueling operations.

Step 2. Disconnect remote control switch cable from EMI control box.

Step 3. Reset 2A circuit breaker on front of EMI control box and continue with fueling operations using On/Off EMI control box switch.

a. If 2A circuit breaker trips, contact Field Maintenance.

b. If 2A circuit breaker does not trip, but condition still exists, contact Field Maintenance.

c. If condition does not exist, continue with fueling operations using On/Off EMI control box switch and contact Field Maintenance to isolate fault in remote control switch circuit.

FUEL PUMP ASSEMBLY DOES NOT RUN WHEN USING ON/OFF REMOTE CONTROL SWITCH - CONTINUED

MALFUNCTION

On/Off remote control switch not functioning properly.

CORRECTIVE ACTION

Step 1. Disconnect remote control switch cable from EMI control box.

Step 2. Continue with fueling operations using On/Off EMI control box switch.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations using On/Off EMI control box switch and contact Field Maintenance to isolate fault in remote control switch circuit.

MALFUNCTION

Master switch on EMI control box not functioning properly.

CORRECTIVE ACTION

Step 1. Turn master switch from ON to OFF to ON.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Cables not connected correctly.

CORRECTIVE ACTION

Step 1. Ensure cables to EMI control box are connected correctly (WP 0006).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Power source not functioning properly.

CORRECTIVE ACTION

Step 1. Replace power source.

a. If condition still exists, contact Field Maintenance.

b. If condition does not exist, continue with fueling operations.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL PUMP ASSEMBLY RUNS, BUT NO FLOW, RUNS SLOW, STALLS, OR MAKES EXCESSIVE NOISE TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0012
WP 0013

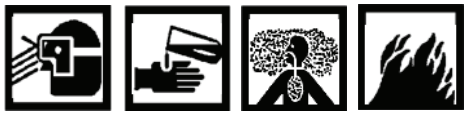
References - Continued

WP 0014
WP 0015
WP 0063

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)
TRM loaded with fuel (WP 0007, WP 0008, WP 0009, WP 0010, WP 0018)

WARNING



Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

TROUBLESHOOTING PROCEDURE

FUEL PUMP ASSEMBLY RUNS, BUT NO FLOW

SYMPTOM

Fuel pump assembly runs, but no flow.

MALFUNCTION

Fuel pump assembly strainer blocked.

CORRECTIVE ACTION

Step 1. Remove, inspect, clean, and install fuel pump assembly strainer (WP 0063).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

FUEL PUMP ASSEMBLY RUNS, BUT NO FLOW - CONTINUED

MALFUNCTION

Tank fuel level low.

CORRECTIVE ACTION

Step 1. If fuel level is low, add fuel to tank (WP 0007, WP 0008, WP 0009, WP 0010, and WP 0018).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Valves are not set correctly.

CORRECTIVE ACTION

Step 1. Ensure the correct valves are opened and/or closed in accordance with current pumping operations (WP 0012, WP 0013, WP 0014, and WP 0015).

Step 2. If condition still exists, contact Field Maintenance.

END OF TASK

FUEL PUMP ASSEMBLY LOW FLOW RATE

SYMPTOM

Fuel pump assembly flow rate is low.

MALFUNCTION

Fuel pump assembly strainer blocked.

CORRECTIVE ACTION

Step 1. Remove, inspect, clean, and install fuel pump assembly strainer (WP 0063).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Low voltage from external power source.

CORRECTIVE ACTION

Step 1. Change external power source (WP 0006).

Step 2. Continue fueling operations.

Step 3. If condition still exists, contact Field Maintenance.

END OF TASK

FUEL PUMP ASSEMBLY STALLS WHEN NOZZLE IS CLOSED

SYMPTOM

Fuel pump assembly stalls when nozzle is closed.

MALFUNCTION

Low voltage from external power source.

CORRECTIVE ACTION

Step 1. Change external power source (WP 0006).

Step 2. Continue fueling operations.

a. If condition still exists, proceed to next malfunction.

b. If condition does not exist, continue with fueling operations.

MALFUNCTION

Fuel pump assembly defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

FUEL PUMP ASSEMBLY MAKES EXCESSIVE NOISE

SYMPTOM

Fuel pump assembly makes excessive noise.

MALFUNCTION

Fuel pump assembly not securely mounted.

CORRECTIVE ACTION

Step 1. If fuel pump assembly is not securely mounted, stop fueling operations immediately and contact Field Maintenance.

Step 2. If fuel pump assembly is securely mounted, proceed to next malfunction.

MALFUNCTION

Fuel pump assembly defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FLOW METER LEAKS FUEL, OR FLOW IS SLOW, OR DOES NOT REGISTER TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0054

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of TRM components.

TROUBLESHOOTING PROCEDURE

FLOW METER LEAKS FUEL

SYMPTOM

Flow meter leaks fuel from meter cover.

MALFUNCTION

Seal inside flow meter is damaged.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

FUEL FLOW IS SLOW OR HAS STOPPED

SYMPTOM

Fuel flow is slow or has stopped.

MALFUNCTION

Fuel pump assembly is not running.

CORRECTIVE ACTION

Step 1. Perform troubleshooting procedures for fuel pump assembly (WP 0054).

END OF TASK

FUEL FLOWS, BUT REGISTER DOES NOT SHOW CORRECT GALLONS

SYMPTOM

Fuel flows, but register does not show correct gallons.

MALFUNCTION

Flow meter is damaged or defective.

CORRECTIVE ACTION

Step 1. Reset flow meter to zero and continue fueling operations.

Step 2. If condition still exists, contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FILTER/SEPARATOR LEAKS FUEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of TRM components.

TROUBLESHOOTING PROCEDURE

FILTER/SEPARATOR LEAKS FUEL

SYMPTOM

Filter/separator leaks fuel from input or output piping.

MALFUNCTION

Tapered thread fittings are loose.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

SYMPTOM

Fuel leaks from top cover.

MALFUNCTION

Cover clamp is loose or head assembly seal is damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FILTER/SEPARATOR DIFFERENTIAL PRESSURE GAUGE INDICATOR IS IN RED AREA TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of TRM components.

TROUBLESHOOTING PROCEDURE

DIFFERENTIAL PRESSURE GAUGE INDICATOR IS IN RED AREA

SYMPTOM

Differential pressure gauge indicator is in RED area of gauge.

MALFUNCTION

Fuel flow through filter/separator is obstructed.

CORRECTIVE ACTION

Step 1. Stop fueling operations.

Step 2. Remove kinks from hoses.

Step 3. Ensure all valves are in correct position for current fueling operations.

Step 4. Continue fueling operations. If condition still exists, stop fueling operations and contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

LOW FLOW RATE AT DISCHARGE NOZZLE TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)

References

WP 0004
WP 0054

References - Continued

WP 0055
WP 0057

Equipment Condition

TRM prepared for use (WP 0005)
TRM prepared for retail operation (WP 0006)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of TRM components.

TROUBLESHOOTING PROCEDURE

LOW FLOW RATE AT DISCHARGE NOZZLE

SYMPTOM

Flow rate from discharge nozzle is low.

MALFUNCTION

Fuel pump assembly not functioning properly.

CORRECTIVE ACTION

Step 1. Perform troubleshooting procedure for fuel pump assembly (WP 0054).

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

Filter/separator differential pressure gauge is in RED area.

CORRECTIVE ACTION

Step 1. Perform troubleshooting procedure for filter/separator (WP 0057).

Step 2. If condition still exists, proceed to next malfunction.

LOW FLOW RATE AT DISCHARGE NOZZLE - CONTINUED

MALFUNCTION

Flow meter is not functioning properly.

CORRECTIVE ACTION

Step 1. Perform troubleshooting procedure for flow meter (WP 0055).

Step 2. If condition still exists, proceed to next malfunction.

MALFUNCTION

Discharge nozzle damaged or defective.

CORRECTIVE ACTION

Step 1. Contact Field Maintenance.

END OF TASK

END OF WORK PACKAGE

CHAPTER 4

OPERATOR MAINTENANCE INSTRUCTIONS

OPERATOR MAINTENANCE

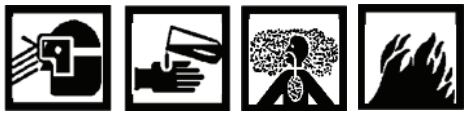
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION
General, Leakage Definitions, Inspection

GENERAL

1. Preventive Maintenance Checks and Services (PMCS) are performed to keep the Tank Rack Module (TRM) in operating condition. The checks are used to find, correct or report problems. Operators should perform the PMCS as shown in the PMCS table. Using the PMCS table, preventive maintenance checks and services are performed every day the equipment is operated. Pay attention to WARNING and CAUTION statements. A WARNING indicates that someone could be injured or killed. A CAUTION indicates the possibility of equipment damage.
2. Perform ***BEFORE*** PMCS prior to operating the equipment.
3. Perform ***DURING*** PMCS during equipment operation.
4. Perform ***AFTER*** PMCS upon completion of equipment operation.
5. Use troubleshooting and/or maintenance procedures to correct problems found when performing PMCS.
6. The right-hand column of the PMCS table lists conditions that classify the equipment as *not fully mission capable*. Perform operator troubleshooting in accordance with this technical manual. Report items as *not-fixed* on DA Form 5988-E or DA Form 2404 for Field Maintenance. For further information on how to use this form, see DA PAM 750-8.

LEAKAGE DEFINITIONS

WARNING



Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply could result in injury or death to personnel.

CAUTION

Equipment operation is allowed with minor Class I or II leakage. Class III leaks must be reported immediately to Field Maintenance. Failure to comply may cause damage to equipment.

1. When operating with Class I or II leaks, continue to check for leakage as required in your PMCS.
2. If there is a Class III leak, shut down operation immediately, and report it to Field Maintenance.
3. It is important to understand how fluid leakage affects the status of the TRM. Following are definitions of the leakage classes the operator needs to become familiar with in order to be able to determine the condition of the leak. Remember, when in doubt, always consult your supervisor.
4. Leakage Classifications for Operator PMCS:
   a. CLASS I - Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
   b. CLASS II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being inspected.
   c. CLASS III - Leakage of fluid great enough to form drops that fall from the item being inspected.

INSPECTION

1. Look for signs of a problem or trouble. You can feel, smell, hear, or see many problems. Be alert when using the equipment.
2. Inspect to ensure items are in good condition. Are they correctly assembled, stowed, secured, properly lubricated, or excessively worn, leaking, or corroded? Correct any problems found or notify Field Maintenance.
3. The following are common items to check throughout the equipment:
    a. Bolts, clamps, nuts and screws: Continually check for looseness. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts, and tighten when loose.
    b. Welds: Many items on the equipment are welded. To check defective welds, look for chipped paint, rust, corrosion or gaps. When these conditions exist, notify Field Maintenance on DA Form 5988-E or DA Form 2404.
    c. Electrical wires, connectors and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires, and broken connectors. If any of these conditions exist, notify Field Maintenance.
    d. Electrical connectors: Check electrical connectors for dirt and debris. Remove any dirt and debris found. Look for bent, broken, or missing connector pins. If any of these conditions exist, notify Field Maintenance.
    e. Hoses and fluid lines: Look for wear, damage and leaks. Ensure that clamps and fittings are tight. Wet spots indicate leakage. A stain near a fitting or connector can also indicate leakage. If leakage is discovered, notify Field Maintenance.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP

Tools and Special Tools	References
Apron, utility (WP 0067, Item 1)	WP 0004
Fire extinguisher (WP 0066, Table 1, Item 1)	WP 0031
Gloves, rubber, industrial (WP 0067, Item 6)	WP 0061
Goggles, industrial (WP 0067, Item 7)	WP 0066

Personnel Required

Two

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and TRM connection points.

Table 1. Preventive Maintenance Checks and Services.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Before	TRM Frame	a. Check TRM frame for damage and broken or cracked welds.	TRM frame has broken or cracked welds.
			b. Check installed ladders for loose or missing hardware.	Ladders have missing hardware.
			c. Check handles for loose or missing hardware.	Handles have missing hardware.
			d. Check roller assemblies for damage and loose or missing hardware.	Rollers are damaged or missing hardware (if required for mission).
			e. Check placards for damage, loose or missing hardware.	
			f. Check stenciling and data plate around frame for legibility.	
			g. Check hose trough assembly for dents, loose or missing hardware.	
2	Before	Tank Assembly	a. Check tank shell for dents, leakage, and broken welds.	All leaks are found.
			b. Check tank mounting hardware, isolation mounts and helical compression springs for loose or missing hardware.	Loose or missing hardware.
			c. Check area around and under tank for leakage.	All leaks are found.
			d. Check V1 valve for leakage.	All leaks are found.
			e. Check V2 valve for leakage.	All leaks are found.
			f. Check stenciling and data plates around tank for legibility.	
	RIGHT SIDE			
3	Before	Bottom Load Valve Piping Assembly (Port G)	a. Check piping assembly for any damage that may cause leakage	All leaks are found.
			b. Check V13 valve for leakage.	All leaks are found.
			c. Check piping assembly and V13 valve for loose or missing hardware.	Piping assembly or V13 valve has missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.

Table 1. Preventive Maintenance Checks and Services. - Continued

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
4	Before	Right Hand Emergency Shutoff Lever	Check emergency shutoff lever operation. • Open V1 and V2 valves. • Pull right hand emergency shut-off lever and observe V1 and V2 valves. • Open V1 valve to reset emergency shutoff. • Close V1 valve.	Emergency shutoff lever does not shut V1 and V2 valves.
5	Before	Bottom Load Valve Piping Assembly (Port B)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check V5 valve for leakage or damage.	All leaks are found.
			c. Check piping assembly and V5 valve for loose or missing hardware.	Piping assembly or V5 valve has missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.
			e. Check VB1 valve for leakage or damage.	All leaks are found.
6	Before	Coupling Half, Quick-Disconnect (Port A)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check coupling half, quick-disconnect for leakage or damage that may cause leakage.	All leaks are found.
			c. Check piping assembly and quick-disconnect coupling half for loose or missing hardware.	Piping assembly or quick-disconnect coupling half has missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.
			e. Check V6 valve for damage that may cause leakage.	All leaks are found.
			f. Check precheck tubing for damage that may cause leakage.	All leaks are found.
7	Before	Vapor Recovery Piping Assembly	a. Check vapor recovery piping assembly for dents, cracks, or damage.	Dented, cracked, or damaged.
			b. Check vapor recovery piping assembly for leakage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
7 (Cont)	Before	Vapor Recovery Piping Assembly	c. Check vapor recovery piping assembly for loose or missing hardware. d. Check dust cap for damage and missing seal.	Loose or missing hardware. Seal is damaged or missing.
8	Before	Side Mechanical Operator (V2 valve)	a. Check control lever assembly for damage, loose or missing hardware. b. Check pull cable tubing assembly for damage, bent, broken, or missing hardware. c. Check pull cables for cuts, fraying, or damage.	Control lever is damaged or missing hardware. Pull cable tubing has missing hardware. Cables are cut, frayed, or damaged.
9	Before	Manhole Transporter Cover	Check transporter cover for damage or missing hardware.	Transporter cover is damaged or missing (if required for mission).
10	Before	Ground Rod	Check for damaged or missing ground rod and mounting hardware.	Ground rod is damaged or missing.
11	Before	Drip Pans	Check that drip pans are present.	Drip pans are not present.
12	Before	Control Lever Assembly (V1 valve)	a. Check control lever assembly (V1 valve) for damage, loose or missing hardware. b. Check pull cable tubing for damage, bent, broken, or missing hardware. c. Check pull cables for cuts, fraying, or damage.	Control lever is damaged or hardware is missing. Pull cable tubing damaged or missing hardware. Cables are cut, frayed, or damaged.
13	Before	EMI Control Box Cables	a. Check 40 ft slave cable, NATO cable assembly, pump control cable, remote control switch box assembly, and genset cable assembly for cuts, fraying, or damage. Refer to WP 0031, Figure 1, for cable location. b. Check NATO and genset cable assembly connectors for damage.	Cables are cut, frayed, or damaged. Connector damaged and not operational.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
	REAR			
14	Before	Right Hand Discharge Arm (Port E)	a. Check discharge arm assembly for damage or leakage.	All leaks are found.
			b. Check hoses for any missing hardware or damage that may cause leakage.	All leaks are found.
			c. Check V12, V8 and V4 valves for damage that may cause leakage.	All leaks are found.
			d. Check piping assembly and V12, V8, V4 valves for loose or missing hardware.	Piping assembly or V12, V8 or V4 valves have missing hardware.
			e. Check seals, quick-disconnect coupling, and all fittings for damage or leakage.	All leaks are found.
			f. Check dust cap and seal for damage.	Seal is damaged or missing.
15	Before	Static Ground Reel Assemblies	a. Check reels for damage, loose or missing hardware.	Reel is missing hardware, or is damaged.
			b. Check grounding cable for cuts, fraying or damage.	Grounding cable is cut, frayed or damaged.
16	Before	Camlock Adapter	a. Check camlock adapter (WP 0066) for damage that may cause leakage.	Camlock adapter has damage that may cause leakage.
			b. Check butterfly valve for damage that may cause leakage.	Butterfly valve has damage that may cause leakage.
			c. Check tiedown straps for serviceability.	
			d. Check dust caps, seals, and plug for damage.	Seals are damaged or missing.
17	Before	Fire Extinguisher	a. Ensure fire extinguisher is present.	Fire extinguisher is not present.
			b. Check fire extinguisher for serviceability and gauge for indication of full charge.	Fire extinguisher is not fully charged or is damaged.
18	Before	Discharge Piping Assembly (Port C)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check V7 valve for leakage or damage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
18 (Cont)	Before	Discharge Piping Assembly (Port C)	c. Check VB2 valve for leakage or damage.	All leaks are found.
			d. Check piping assembly and V7 valve for loose or missing hardware.	Piping assembly or V7 valve have missing hardware.
			e. Check dust cap and seal for damage.	Seal is damaged or missing.
19	Before	Fuel Pump Assembly	a. Check fuel pump for any damage that may cause leakage.	All leaks are found.
			b. Check hoses for missing hardware or any damage that may cause leakage.	All leaks are found.
			c. Check V10 valve and V14 valve for any damage that may cause leakage.	All leaks are found.
			d. Check piping assembly, V10 valve, and V14 valve for loose or missing hardware.	Piping assembly, V10 or V14 valves have missing hardware.
			e. Check fuel pump assembly wiring harness for damage or missing parts.	Wiring harness damaged or missing parts.
20	Before	Rear Head Tank Gauge	a. Check tank pointer for loose or missing hardware.	
			b. Check tank pointer for damage.	Tank pointer is damaged or does not operate correctly.
21	Before	Filter/Separator	a. Check for missing or damaged mounting hardware.	Filter/Separator is missing hardware.
			b. Check for leaks.	All leaks are found.
			c. Check V15 valve and V16 valve for any damage that may cause leakage.	All leaks are found.
			d. Check coupling and gauges for any damage that may cause leakage.	All leaks are found.
			e. Check drain hose for any missing hardware or damage that may cause leakage.	All leaks are found.
			f. Check seals and joints for any damage that may cause leakage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
21 (Cont)	Before	Filter/Separator	g. Check sight gauge for presence of water. Place drip pan under manual drain valve and drain any water (WP 0061).	Float ball is at top of sight gauge.
22	Before	Flow Meter	a. Check for cracks in cover.	
			b. Check for leaks.	All leaks are found.
			c. Check for missing or damaged mounting hardware.	
			d. Ensure flow meter can be reset.	
23	Before	EMI Control Box	a. Check EMI control box for loose or missing hardware.	EMI control box is missing hardware.
			b. Check connectors, switches and knobs for damage or missing hardware.	Connector, switch or knob not operational.
			c. Check connectors for dirt, oil, and debris.	
24	Before	Left Hand Discharge Arm (Port D)	a. Check discharge arm for damage or leakage.	All leaks are found.
			b. Check hoses for any damage that may cause leakage.	All leaks are found.
			c. Check V11, V3, and V9 valves for damage that may cause leakage.	All leaks are found.
			d. Check piping assembly and V11, V9, V3 valves for loose or missing hardware.	Piping assembly or V11, V9 or V3 valves have missing hardware.
			e. Check dust cap and seal for damage.	Seal is damaged or missing.
			WARNING Location of tiedown strap can pinch or injure fingers when checking for serviceability. To avoid personal injury, do not put fingers in ratchet section of tiedown strap. Failure to comply could result in injury to personnel.	
25	Before	Tee Assembly	a. Check tee assembly (WP 0066) for damage that may cause leakage.	Tee assembly has damage that may cause leakage.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
25 (Cont)			b. Check butterfly valve for damage that may cause leakage.	Butterfly valve has damage that may cause leakage.
			c. Check tiedown straps for serviceability.	
			d. Check dust caps, seals, and plug for damage.	Seal is damaged or missing.
	LEFT SIDE			
26	Before	4 in. x 15 ft (10.16 cm x 4.6 m) Suction Hoses	a. Check all 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses for any damage that may cause leakage.	Hose is damaged.
			b. Check coupling halves for damage.	Coupling half is damaged.
			c. Check dust cap, seal, and plugs for damage.	Seal is damaged or missing.
			d. Check hoses for signs of fraying or dry rot.	Hose is frayed or has dry rot.
27	Before	2 in. x 13 ft (5.08 cm x 3.96 m) Discharge Hoses	a. Check 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose for any damage that may cause leakage.	Hose is damaged.
			b. Check quick-disconnect couplings for damage.	Quick-disconnect coupling is damaged.
			c. Check dust cap, seal, and plugs for damage.	Seal is damaged or missing.
			d. Check hoses for signs of fraying or dry rot.	Hose is frayed or has dry rot.
28	Before	ISO Ladder	Ensure ISO ladder is present.	ISO ladder is not present (if required for mission).
29	Before		Check ISO ladder for damage.	ISO ladder is damaged (if required for mission).
30	Before		Check for missing or damaged ISO ladder mounting hardware.	

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
31	Before **FRONT**	Left Hand Emergency Shutoff Lever	Check emergency shutoff lever operation. • Open V1 and V2 valves. • Pull left hand emergency shutoff lever and observe control levers V1 and V2 valves. • Open V1 valve to reset emergency shutoff. • Close V1 valve.	Emergency shutoff lever does not shut V1 and V2.
32	Before	Spill Containment Kit	Check that spill containment kit is present and secure.	Spill containment kit is missing.
33	Before	Fire Extinguisher	a. Ensure fire extinguisher is present.	Fire extinguisher is not present.
			b. Check fire extinguisher for serviceability and gauge for indication of full charge.	Fire extinguisher is not fully charged or is damaged.
34	Before	Tool Box	Check tool box for damage or loose or missing hardware.	
35	Before	Nozzle Assembly (Open Port)	a. Check nozzle for any damage that may cause leakage.	Nozzle has damage that may cause leakage.
			b. Check bonding cable for damage, cuts, or fraying.	Bonding cable is damaged, cut or frayed.
			c. Check dust cover for damage.	
36	Before	3 in. x 3.5 ft (7.6 cm x 1.1 m) Discharge Hose	a. Check hose for any damage that may cause leakage.	Hose is damaged.
			b. Check coupling halves for damage.	Coupling half is damaged.
			c. Check dust cap, seal, and plugs for damage.	Seal is damaged or missing.
			d. Check hose for signs of fraying or dry rot.	Hose is frayed or has dry rot.
37	Before	Flange Adapter Assembly (D1)	a. Check nozzle for any damage that may cause leakage.	Nozzle has damage that may cause leakage.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			b. Check dust cover for damage.	
38	Before	4 in. to 3 in. (10.16 cm to 7.6 cm) Reducer	a. Check for any damage that may cause leakage.	Reducer has damage that may cause leakage.
			b. Check seal for damage.	Seal is missing or damaged.
39	Before	NATO adapter, Female	a. Check for any damage that may cause leakage.	Connector has damage that may cause leakage (if required for mission).
			b. Check plug and dust cap for damage.	
40	Before	NATO adapter, Male	a. Check for any damage that may cause leakage.	Connector has damage that may cause leakage (if required for mission).
			b. Check plug and dust cap for damage.	
	TOP		**WARNING** • To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover. • Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly. • Eye protection is required when opening manhole cover. • Failure to comply could result in injury or death to personnel.	
41	Before	Manhole Cover	a. Check cover for leakage.	All leaks are found.
			b. Open cover access and check gasket for damage.	Gasket is damaged or missing.
			c. Close cover access and check for secure latching.	Cover cannot be securely latched.
42	Before	Liquid Level Switch (Inside tank)	a. Open cover access and check liquid level switch for damage.	Liquid level switch is damaged or fuel lines are loose, cut, or deteriorated.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
42 (Cont)	Before	Liquid Level Switch (Inside tank)	b. Check liquid level switch for loose or missing hardware.	Liquid level switch has missing hardware.
			c. Check attached fuel lines for cuts or deterioration.	Attached fuel lines are damaged or deteriorated.
43	Before	Non-Valved Unisex Coupling (Top Fill Port F)	Check non-valved, unisex coupling and seal for any damage that may cause leakage.	All leaks are found.
44	Before	Spillbox	a. Check spillbox drains for clogs or restrictions.	Drains clogged.
			b. Check hose and valve for damage.	All leaks are found.
			c. Check ground studs.	Ground studs damaged or missing.
45	Before	Spillbox Valves	a. Check spillbox valves for damage.	All leaks are found.
			b. Check spill valve hoses for loose or missing hardware.	Loose or missing hardware.
			c. Check spill valve hoses for damage or cuts.	All leaks are found.
46	Before	Stowage Tube Assembly	a. Check stowage tube assembly for loose or missing hardware.	Stowage tube assembly missing hardware.
			b. Ensure gauge stick is present.	Gauge stick is not present.
47	Before	Vent Hood	a. Check vent hood for damage that may cause leakage.	All leaks are found.
			b. Check vent hood for loose or missing hardware.	Vent hood missing hardware.
48	Before	Rear Catwalk	a. Check for loose or missing hardware.	Loose or missing hardware.
			b. Check catwalk for damage or broken welds.	Damaged or broken welds.
49	During	Tank Assembly	a. Check area around and under tank for leakage.	All leaks are found.
			b. Check V1 valve for leakage.	All leaks are found.
			c. Check V2 valve for leakage.	All leaks are found.
50	During	Tee Assembly (if in use)	a. Check tee assembly for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
			c. Check butterfly valve for leakage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
51	During	4 in. to 3 in. (10.16 cm to 7.6 cm) Reducer	Check 4 in. to 3 in. (10.16 cm to 7.6 cm) reducer for leakage.	All leaks are found.
52	During	3 in. x 3.5 ft (7.6 cm x 1.1 m) Discharge Hose (if in use)	a. Check hose for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
53	During	Flange Adapter Assembly (if in use)	a. Check coupling halves for leakage.	All leaks are found.
			b. Check nozzle for leakage.	All leaks are found.
54	During	4 in. x 15 ft (10.16 cm x 4.6 m) Suction Hoses (if in use)	a. Check 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
	RIGHT SIDE			
55	During	Bottom Load Valve Piping Assembly (Port G)	a. Check piping assembly for leakage	All leaks are found.
			b. Check V13 valve for leakage.	All leaks are found.
56	During	Bottom Load Inlet Piping Assembly (Port B)	a. Check piping assembly for leakage.	All leaks are found.
			b. Check V5 valve for leakage.	All leaks are found.
57	During	NATO adapter, female (if in use)	Check for leakage.	All leaks are found.
58	During	NATO adapter, male (if in use)	Check for leakage.	All leaks are found.
59	During	Coupling Half, Quick-Disconnect (Port A)	Check coupling half for leakage.	All leaks are found.
	REAR			
60	During	Right Hand Discharge Arm (Port E)	a. Check discharge arm assembly for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
			c. Check hoses for leakage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
61	During	Discharge Piping Assembly (Port C)	a. Check piping assembly for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
			c. Check V7 valve for leakage.	All leaks are found.
62	During	Left Hand Discharge Arm (Port D)	a. Check discharge arm for leakage.	All leaks are found.
			b. Check coupling halves for leakage.	All leaks are found.
63	During	Fuel Pump Assembly	a. Check fuel pump for leakage.	All leaks are found.
			b. Check V10 valve and V14 valve for leakage.	All leaks are found.
			c. Check piping assembly for leakage.	All leaks are found.
			d. Check for excessive noise or vibration of pump assembly or motor.	Excessive noise or vibration.
64	During	Filter/Separator	a. Check filter/separator for any damage that may cause leakage.	All leaks are found.
			b. Check differential pressure gauge during operation.	Differential pressure gauge reading is in red area.
			c. Check sight gauge for presence of water. Place drip pan under manual drain valve and drain any water (WP 0061).	Float ball is at top of sight gauge.
65	During	Flow Meter	a. Check flow meter is registering fuel flow.	
			b. Check for leakage from flow meter.	All leaks are found.
66	During	Camlock Adapter	Check camlock adapter (WP 0066) for damage that may cause leakage.	Camlock adapter has damage that may cause leakage.
67	After	TRM Frame	a. Check TRM frame for damage and broken or cracked welds.	TRM frame has broken or cracked welds.
			b. Check installed ladders for loose or missing hardware.	Ladders have missing hardware.
			c. Check handles for loose or missing hardware.	Handles have missing hardware.
			d. Check roller assemblies for damage and loose or missing hardware.	Rollers are damaged or missing hardware (if required for mission).

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
67 (Cont)	After	TRM Frame	e. Check placards for damage, loose or missing hardware.	
			f. Check stenciling and data plate around frame for legibility.	
			g. Check hose trough for dents, loose or missing hardware.	
68	After	Tank Assembly	a. Check tank shell for dents leakage and broken welds.	All leaks are found.
			b. Check tank mounting hardware, isolation mounts and helical compression springs for loose or missing hardware.	
			c. Check area around and under tank for evidence of leakage.	All leaks are found.
			d. Check V1 valve for leakage.	All leaks are found.
			e. Check V2 valve for leakage.	All leaks are found.
			f. Check stenciling and data plates around tank for legibility.	
	RIGHT SIDE			
69	After	Bottom Load Valve Piping Assembly (Port G)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check V13 valve for leakage.	All leaks are found.
			c. Check piping assembly and V13 valve for loose or missing hardware.	Piping assembly or V13 valve has missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.
70	After	Right Hand Emergency Shutoff Lever	Check emergency shutoff lever operation. • Open V1 and V2 valves. • Pull right hand emergency shutoff lever and V1 and V2 valves should close. • Open V1 valve to reset emergency shutoff. • Close V1 valve.	Emergency shutoff lever does not shut V1 and V2 valves.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
71	After	Bottom Load Valve Piping Assembly (Port B)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check V5 valve for leakage or damage.	All leaks are found.
			c. Check piping assembly and V5 valve for loose or missing hardware.	Piping assembly or V5 valve has missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.
			e. Check VB1 valve for leakage or damage.	All leaks are found.
72	After	Coupling Half, Quick-Disconnect (Port A)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check coupling half, quick-disconnect for leakage or damage that may cause leakage.	All leaks are found.
			c. Check piping assembly and coupling half for loose or missing hardware.	Piping assembly or coupling half have missing hardware.
			d. Check dust cap and seal for damage.	Seal is damaged or missing.
			e. Check V6 valve for damage that may cause leakage.	All leaks are found.
			f. Check precheck tubing for damage that may cause leakage.	All leaks are found.
73	After	Vapor Recovery Piping Assembly	a. Check piping assembly for dents, cracks, or damage.	Dented, cracked, or damaged.
			b. Check piping assembly for loose or missing hardware.	Loose or missing hardware.
			c. Check dust cap for damage and missing seal.	Seal is damaged or missing.
			d. Check vapor recovery piping assembly for leakage.	All leaks are found.
74	After	Side Mechanical Operator (V2 valve)	a. Check side control lever assembly for damage, loose, or missing hardware.	Control lever is damaged or missing hardware.
			b. Check pull cable tubing assembly for damage, bent, broken, or missing hardware.	Pull cable tubing has missing hardware.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
74 (Cont)	After	Side Mechanical Operator (V2 valve)	c. Check pull cables for cuts, fraying, or damage.	Pull cables are cut, frayed, or damaged.
75	After	Transporter Cover	Check transporter cover for damage or missing hardware.	
76	After	Ground Rod	a. Check for damaged or missing ground rod.	Ground rod is damaged or missing.
			b. Check ground rod mounting hardware for damage.	Ground rod mounting hardware damaged.
77	After	Drip Pans	a. Check that drip pans are present and secured.	Drip pans are not present.
			b. Check drip pan mounting bracket for loose or missing hardware or damage.	
78	After	Control Lever Assembly (V1 valve)	a. Check control lever assembly (V1 valve) for damage, loose or missing hardware.	Control lever is damaged or hardware is missing.
			b. Check pull cable tubing for damage, or missing hardware.	Pull cable tubing damaged or missing hardware.
			c. Check pull cables for cuts, fraying, or damage.	Cables are cut, frayed, or damaged.
	REAR			
79	After	Right Hand Discharge Arm (Port E)	a. Check discharge arm assembly for damage or leakage.	All leaks are found.
			b. Check hoses for any missing hardware or damage that may cause leakage.	All leaks are found.
			c. Check V12, V8 and V4 valves for damage that may cause leakage.	All leaks are found.
			d. Check piping assembly and V12, V8, and V4 valves for loose or missing hardware.	Piping assembly or V12, V8, or V4 valves have missing hardware.
			e. Check seals, quick-disconnect coupling, and all fittings for damage or leakage.	All leaks are found.
			f. Check dust cap and seal for damage.	Seal is damaged or missing.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
80	After	Static Ground Reel Assemblies	a. Check reels for damage, loose or missing hardware.	Reel is missing hardware, or is damaged.
			b. Check grounding cable for cuts, fraying, or damage.	Grounding cable is cut, frayed, or damaged.
81	After	Camlock Adapter	a. Check camlock adapter for damage that may cause leakage.	Camlock adapter has damage that may cause leakage.
			b. Check butterfly valve for damage that may cause leakage.	Butterfly valve has damage that may cause leakage.
			c. Check gasket for damage or deterioration.	Gasket is deteriorated or missing.
			d. Check tiedown straps for serviceability.	
			e. Check dust caps, seals, and plug for damage.	Seal is damaged or missing.
82	After	Fire Extinguisher	a. Ensure fire extinguisher is present.	Fire extinguisher is not present.
			b. Check fire extinguisher for serviceability and gauge for indication of full charge.	Fire extinguisher is not fully charged or is damaged.
83	After	Discharge Piping Assembly (Port C)	a. Check piping assembly for any damage that may cause leakage.	All leaks are found.
			b. Check V7 valve for leakage or damage.	All leaks are found.
			c. Check VB2 valve for leakage or damage.	All leaks are found.
			d. Check piping assembly and V7 valve for loose or missing hardware.	Piping assembly or V7 valve have missing hardware.
			e. Check dust cap and seal for damage.	Seal is damaged or missing.
84	After	Fuel Pump Assembly	a. Check fuel pump for any damage that may cause leakage.	All leaks are found.
			b. Check hoses for missing hardware and damage that may cause leakage.	All leaks are found.
			c. Check V10 valve and V14 valve for any damage that may cause leakage.	All leaks are found.
			d. Check piping assembly, V10 valve, and V14 valve for loose or missing hardware.	Piping assembly or valves have missing hardware.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
84 (Cont)	After	Fuel Pump Assembly	e. Check fuel pump assembly wiring harness for damage or missing parts.	Wiring harness damaged or parts missing (if required for mission).
85	After	Rear Head Tank Gauge	a. Check tank pointer for loose or missing hardware.	Loose or missing hardware.
			b. Check tank pointer for damage.	Tank pointer is damaged or does not operate correctly.
86	After	Filter/Separator	a. Check for missing or damaged mounting hardware.	Filter/Separator is missing hardware.
			b. Check V15 valve and V16 valve for any damage that may cause leakage.	All leaks are found.
			c. Check coupling and gauges for any damage that may cause leakage.	All leaks are found.
			d. Check drain hose for any missing hardware or damage that may cause leakage.	All leaks are found.
			e. Check seals and joints for any damage that may cause leakage.	All leaks are found.
			f. Check sight gauge for presence of water. Place drip pan under manual drain valve and drain any water (WP 0061).	Float ball is at top of sight gauge.
87	After	Flow Meter	a. Check for cracks in cover.	
			b. Check for leaks.	All leaks are found.
			c. Check for missing or damaged mounting hardware.	
			d. Ensure flow meter can be reset.	
88	After	EMI Control Box	a. Check EMI control box for loose or missing hardware.	EMI control box is missing hardware.
			b. Check connectors, switches and knobs for damage or missing hardware.	Connector, switch or knob not operational.
			c. Check connectors for dirt, oil, and debris.	
89	After	Left Hand Discharge Arm (Port D)	a. Check discharge arm for damage or leakage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
89 (Cont)	After	Left Hand Discharge Arm (Port D)	b. Check hoses for any damage that may cause leakage.	All leaks are found.
			c. Check V11, V9, and V3 valves for damage that may cause leakage.	All leaks are found.
			d. Check seals, quick-disconnect coupling, and all fittings for damage or leakage.	All leaks are found.
			e. Check dust cap and seal for damage.	Seal is damaged or missing.
			f. Check piping assembly and V11, V9, and V3 valves for loose or missing hardware.	Piping assembly or V11, V9, or V3 valves have missing hardware.
90	After	Tee Assembly	a. Check tee assembly for damage that may cause leakage.	Tee assembly has damage that may cause leakage.
			b. Check butterfly valve for damage that may cause leakage.	Butterfly valve has damage that may cause leakage.
			WARNING Location of tee assembly tiedown strap can pinch or injure fingers when checking for serviceability. To avoid personal injury, do not put fingers in ratchet section of tiedown strap. Failure to comply could result in injury to personnel.	
			c. Check tiedown straps for serviceability.	
			d. Check dust caps, seals, and plug for damage.	Seal is damaged or missing.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
	LEFT SIDE			
91	After	4 in. x 15 ft (10.16 cm x 4.6 m) Suction Hoses	a. Check all 4 in. x 15 ft (10.16 cm x 4.6 m) suction hoses for any damage that may cause leakage.	Hose is damaged.
			b. Check coupling halves for damage.	Coupling half is damaged.
			c. Check dust caps, seals, and plugs for damage.	Seal is damaged or missing.
			d. Check hoses for signs of fraying or dry rot.	Hose is frayed or has dry rot.
92	After	2 in. x 13 ft (5.08 cm x 3.96 m) Discharge Hoses	a. Check 2 in. x 13 ft (5.08 cm x 3.96 m) discharge hose for any damage that may cause leakage.	Hose is damaged.
			b. Check quick-disconnect couplings for damage.	Quick-disconnect coupling damaged.
			c. Check dust cap, seal, and plugs for damage.	Seal is damaged or missing.
			d. Check hoses for signs of fraying or dry rot.	Hose is frayed or has dry rot.
93	After	ISO Ladder	Check ISO ladder for damage.	ISO ladder is damaged.
94	After	Left Hand Emergency Shutoff Lever	Check emergency shutoff lever operation. • Open V1 and V2 valves. • Pull left hand emergency shutoff lever and V1 and V2 valves should close. • Open V1 valve to reset emergency shutoff. • Close V1 valve.	Emergency shutoff lever does not shut V1 and V2 valves.
	FRONT			
95	After	Spill Containment Kit	Check that spill containment kit is present and secure.	Spill containment kit is missing.
96	After	Fire Extinguisher	a. Ensure fire extinguisher is present.	Fire extinguisher is not present.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			b. Check fire extinguisher for serviceability and gauge for indication of full charge.	Fire extinguisher is not fully charged or is damaged.
97	After	Tool Box	Check tool box for damage or loose or missing hardware.	
98	After	Nozzle Assembly (Open Port)	a. Check nozzle for any damage that may cause leakage.	Nozzle has damage that may cause leakage.
			b. Check bonding cable for damage, cuts, or fraying.	Bonding cable is damaged, cut, or frayed.
			c. Check dust cover for damage.	
99	After	3 in. x 3.5 ft (7.6 cm x 1.1 m) Discharge Hose	a. Check hose for any damage that may cause leakage.	Hose is damaged.
			b. Check dust cap, seal, and plugs for damage.	Seal is damaged or missing.
			c. Check hose for signs of fraying or dry rot.	Hose is frayed or has dry rot.
100	After	Flange Adapter Assembly (D1)	a. Check nozzle for any damage that may cause leakage.	Nozzle has damage that may cause leakage.
			b. Check dust cover for damage.	
			c. Check camlock cap and seal for damage.	Seal is damaged or missing.
101	After	NATO Adapter, Female	a. Check adapter for any damage that may cause leakage.	Connector has damage that may cause leakage (if required for mission).
			b. Check plug and dust cap seal for damage.	Seal is missing or damaged.
102	After	NATO Adapter, Male	a. Check adapter for any damage that may cause leakage.	Connector has damage that may cause leakage (if required for mission).
			b. Check plug and dust cap seal for damage.	Seal is missing or damaged.
103	After	4 in. to 3 in. (10.16 cm to 7.6 cm) Reducer	a. Check reducer for any damage that may cause leakage.	Reducer has damage that may cause leakage.
			b. Check seal for damage.	Seal is missing or damaged.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
	TOP			
			WARNING • To prevent explosion caused by electrostatic charge, ensure all personnel and equipment are grounded before opening manhole cover. • Due to changes in ambient temperatures, fuel may expand and manhole cover may be under pressure. Open manhole cover slowly. • Eye protection is required when opening manhole cover. • Failure to comply could result in injury or death to personnel.	
104	After	Manhole Cover	a. Check cover for leakage.	All leaks are found.
			b. Open cover access and check gasket for damage.	Gasket is damaged or missing.
			c. Close cover access and check for secure latching.	Cover cannot be securely latched.
105	After	Liquid Level Switch (inside tank)	a. Open cover access and check liquid level switch for damage.	Liquid level switch is damaged or fuel lines are loose, cut, or deteriorated.
			b. Check liquid level switch for loose or missing hardware.	Liquid level switch has missing hardware.
			c. Check attached fuel lines for cuts or deterioration.	Attached fuel lines are damaged or deteriorated.
106	After	Non-Valved, Unisex Coupling (Top Fill Port F)	a. Check bumper for damage or deterioration.	All leaks are found.
			b. Check non-valved, unisex coupling and seal for any damage that may cause leakage.	All leaks are found.
107	After	Spillbox	a. Check spillbox drains for clogs or restrictions.	Drains clogged.
			b. Check hose and valve for damage.	All leaks are found.
			c. Check ground studs.	Ground stud damaged or missing.
108	After	Spillbox Valves	a. Check spillbox valves for damage.	All leaks are found.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
108 (Cont)	After	Spillbox Valves	b. Check spill valve hoses for damage or cuts.	All leaks are found.
			c. Check spill valve hoses for loose or missing hardware.	Loose or missing hardware.
109	After	Stowage Tube Assembly	a. Check stowage tube assembly for loose or missing hardware.	Stowage tube assembly missing hardware.
			b. Ensure gauge stick is present.	Gauge stick is not present.
110	After	Vent Hood	a. Check vent hood for damage that may cause leakage.	Vent hood is frayed, dry rotted, or there is evidence of moisture.
			b. Check vent hood for loose or missing hardware.	
111	After	Rear Catwalk	a. Check for loose or missing hardware.	Rear catwalk has missing hardware.
			b. Check catwalk for damage or broken welds.	Rear catwalk has broken welds.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FILTER/SEPARATOR
DRAIN ACCUMULATED WATER AND FUEL

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)

Personnel Required

Two

Equipment Condition

TRM shut down (WP 0027)
System evacuated (WP 0014)

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

DRAIN ACCUMULATED WATER FROM FILTER/SEPARATOR

1. Place drip pan near filter/separator (Figure 1, Item 2).
2. Release drain hose (Figure 1, Item 4) from holder clip (Figure 1, Item 6) on TRM frame and position drain hose in drip pan.
3. Remove dust plug (Figure 1, Item 5) from drain hose (Figure 1, Item 4).
4. Open V15 valve (Figure 1, Item 3) and drain water from filter/separator (Figure 1, Item 2).
5. Close V15 valve (Figure 1, Item 3) when water has drained from filter/separator sight gauge (Figure 1, Item 1).
6. Install dust plug (Figure 1, Item 5) into drain hose (Figure 1, Item 4).
7. Return drain hose (Figure 1, Item 4) to original position on TRM frame and install in holder clip (Figure 1, Item 6).
8. Remove drip pan and dispose of contents per local standard operating procedures (SOP).

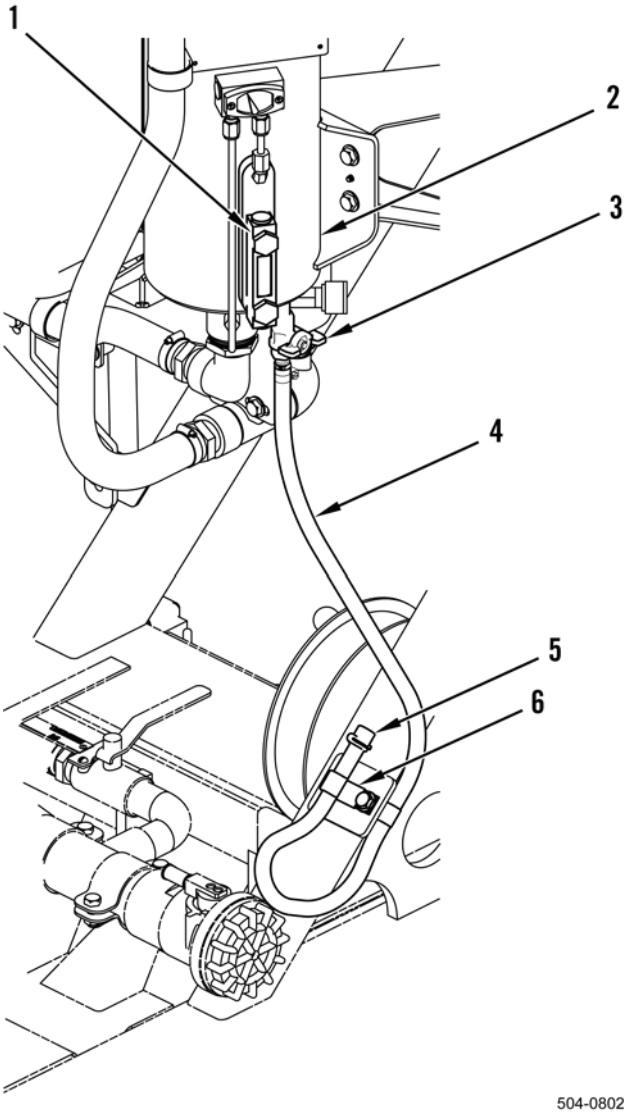


Figure 1. Drain Water from Filter/Separator.

END OF TASK

DRAIN FUEL FROM FILTER/SEPARATOR AND ASSOCIATED PIPING

1. Place drip pan near discharge Port D (Figure 2, Item 6).
2. Release drain hose (Figure 1, Item 4) from holder clip (Figure 1, Item 6) and position drain hose in drip pan.
3. Remove dust plug (Figure 1, Item 5) from drain hose (Figure 1, Item 4).
4. Open V15 valve (Figure 1, Item 3) and drain fuel from filter/separator (Figure 1, Item 2).
5. Open air vent V16 valve (Figure 2, Item 2) on filter/separator (Figure 2, Item 3).
6. Drain fuel until it stops.
7. Close V15 valve (Figure 1, Item 3) and V16 valve (Figure 2, Item 2).
8. Install dust plug (Figure 1, Item 5) into drain hose (Figure 1, Item 4) and return drain hose to original position on TRM frame and install in holder clip (Figure 1, Item 6).
9. Remove dust cap from Port D (Figure 2, Item 6).
10. Open V11 valve (Figure 2, Item 7), V9 valve (Figure 2, Item 5), and V3 valve (Figure 2, Item 1).
11. Drain fuel until it stops.
12. Close V11 valve (Figure 2, Item 7), V9 valve (Figure 2, Item 5), and V3 valve (Figure 2, Item 1).
13. Install dust cap on Port D (Figure 2, Item 6).

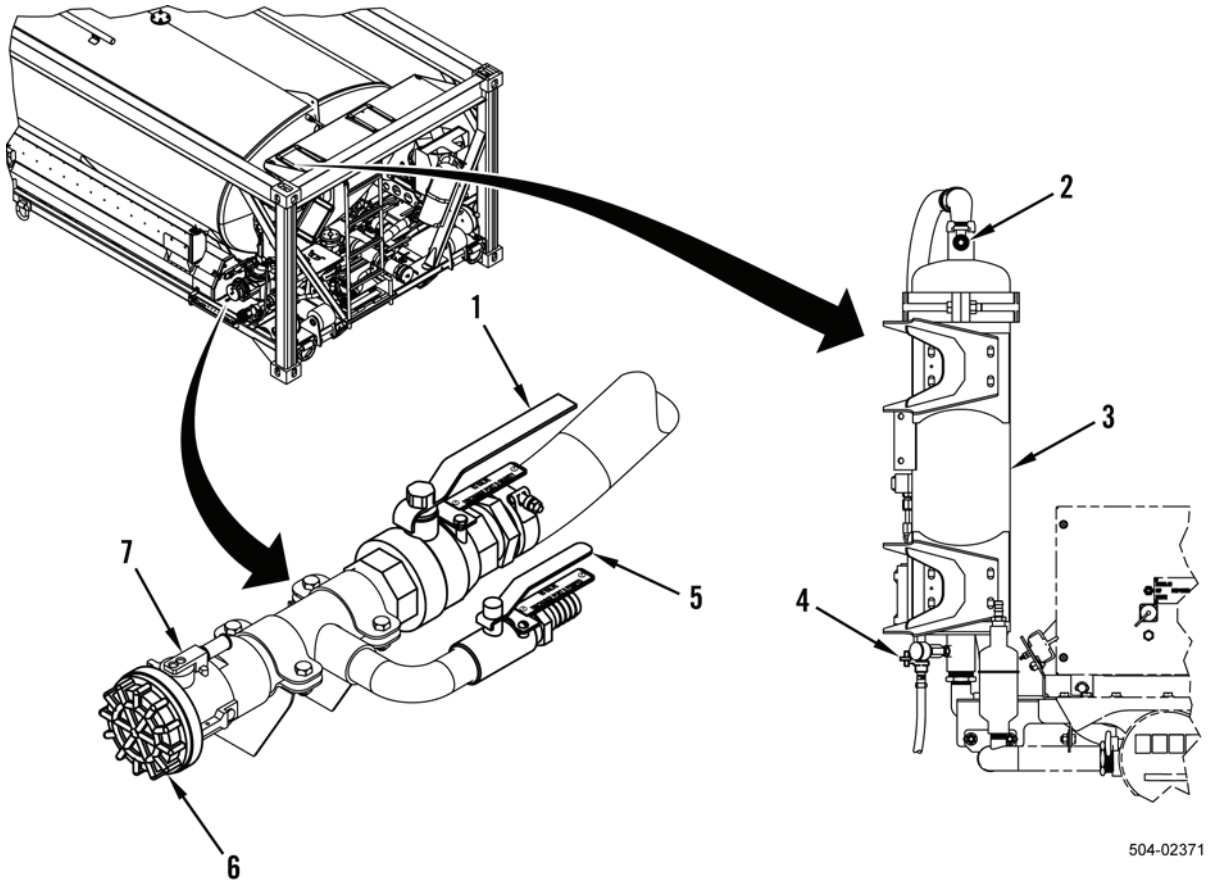


Figure 2. Drain Fuel from Filter/Separator and Associated Piping.

DRAIN FUEL FROM FILTER/SEPARATOR AND ASSOCIATED PIPING - CONTINUED

14. Remove dust cap from Port E (Figure 3, Item 3).
15. Open V12 valve (Figure 3, Item 2), V8 valve (Figure 3, Item 4), and V4 valve (Figure 3, Item 1).
16. Drain fuel until it stops.
17. Close V12 valve (Figure 3, Item 2), V8 valve (Figure 3, Item 4), and V4 valve (Figure 3, Item 1).
18. Install dust cap on Port E (Figure 3, Item 3).
19. Remove drip pans and dispose of contents per local SOP.

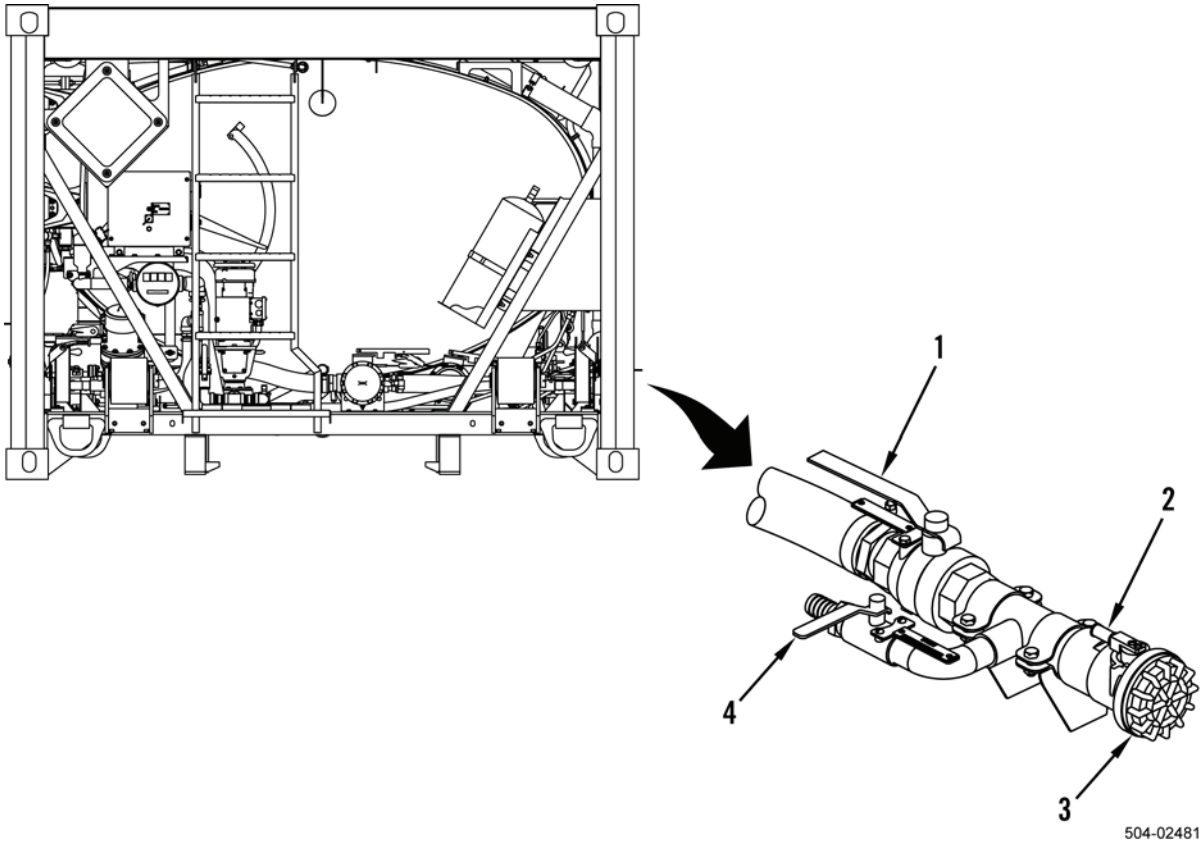


Figure 3. Drain Fuel from Associated Piping.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL SYSTEM COUPLING AND DUST CAP GASKETS REPLACEMENT
Replace Gaskets in Camlock Couplings, Replace Seal in Quick-Disconnect Couplings

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Knife, putty (WP 0066, Table 2, Item 4)
Pan, drip, 6.5 gal. capacity (WP 0066, Table 1, Item 17)
Pick, miniature (seal) (WP 0066, Table 2, Item 5)

Materials/Parts

Cap, bumper (WP 0066, Table 1, Item 24)
Cloth, cleaning (WP 0067, Item 4)

Materials/Parts - Continued

Gasket (WP 0066, Table 1, Item 26) Qty: 2
Seal, plain (WP 0066, Table 1, Item 25) Qty: 2

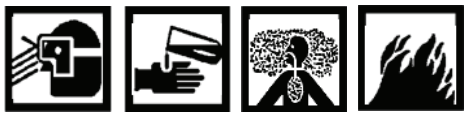
Personnel Required

Two

Equipment Condition

TRM shut down (WP 0027)

WARNING



Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

REPLACE GASKETS IN CAMLOCK COUPLINGS

1. Place drip pans under quick-disconnect coupling halves (Figure 1, Items 3 and 5).
2. Remove dust cap (Figure 1, Item 4) and dust plug (Figure 1, Item 1).
3. Use a seal pick to remove gaskets (Figure 1, Item 2) from dust cap (Figure 1, Item 4) and quick-disconnect coupling half (Figure 1, Item 5). Discard gaskets.
4. Clean quick-disconnect coupling halves (Figure 1, Items 3 and 5) and dust caps (Figure 1, Items 1 and 4).
   a. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas using a putty knife.
   b. Clean all metallic parts with a cleaning cloth.
5. Inspect quick-disconnect coupling halves (Figure 1, Items 3 and 5) and dust caps (Figure 1, Items 1 and 4).
   a. Inspect all metallic parts for cracks, corrosion, or broken fittings. If cracks, corrosion, or broken fittings are found, contact Field Maintenance.
   b. Inspect all split rings (Figure 1, Item 6) for cracks, distortion, and corrosion. If cracks, distortion, or corrosion is found, contact Field Maintenance.
   c. Inspect all wire cables (Figure 1, Item 7) for cracks, frays, distortion, and corrosion. If cracks, frays, distortion, or corrosion is found, contact Field Maintenance.
6. Install new gaskets (Figure 1, Item 2) in dust cap (Figure 1, Item 4) and quick-disconnect coupling half (Figure 1, Item 5).
7. Install dust cap (Figure 1, Item 4) on quick-disconnect coupling half (Figure 1, Item 3).
8. Install dust plug (Figure 1, Item 1) in quick-disconnect coupling half (Figure 1, Item 5).
9. Remove drip pan and dispose of fuel per local SOP.

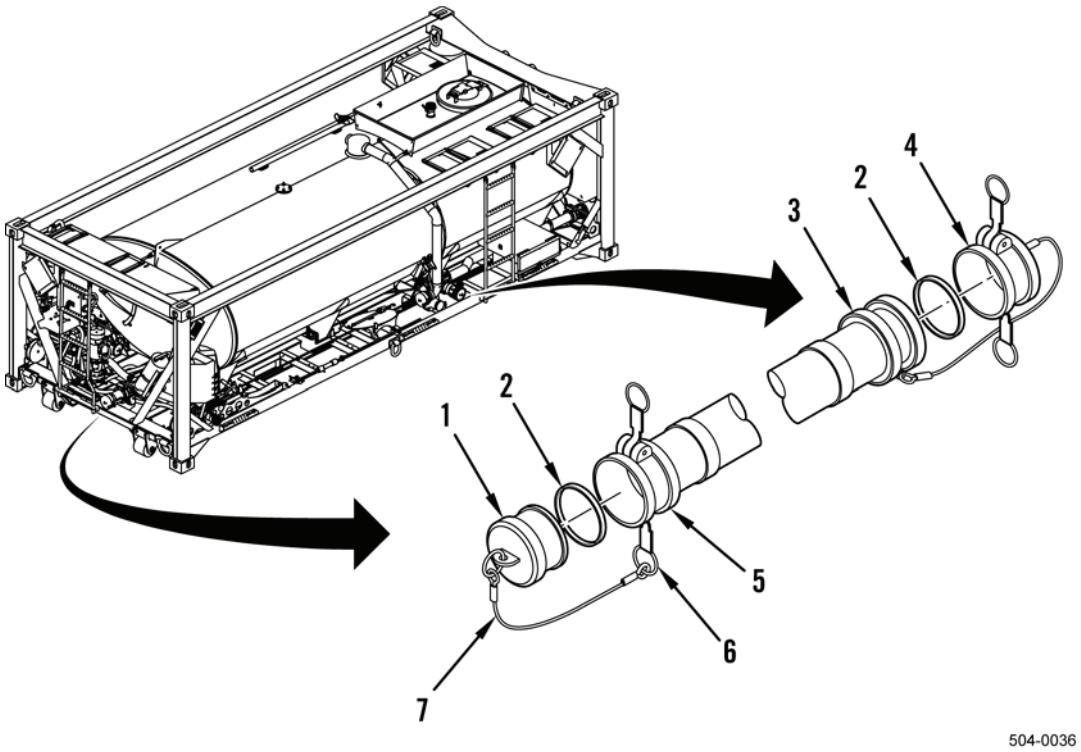


Figure 1. Quick-Disconnect Couplings.

END OF TASK

REPLACE SEALS IN QUICK-DISCONNECT COUPLINGS

1. Place drip pan under quick-disconnect coupling half (Figure 2, Item 3).
2. Remove dust cap (Figure 2, Item 4) from quick-disconnect coupling half (Figure 2, Item 3).

CAUTION

Use caution when removing seals to prevent damage to equipment.

3. Use a seal pick to remove bumper (Figure 2, Item 1) from quick-disconnect coupling half (Figure 2, Item 3). Discard bumper.
4. Use a seal pick to remove seal (Figure 2, Item 2) from quick-disconnect coupling half (Figure 2, Item 3). Discard seal.
5. Use a seal pick to remove seal (Figure 2, Item 5) from dust cap (Figure 2, Item 4). Discard seal.

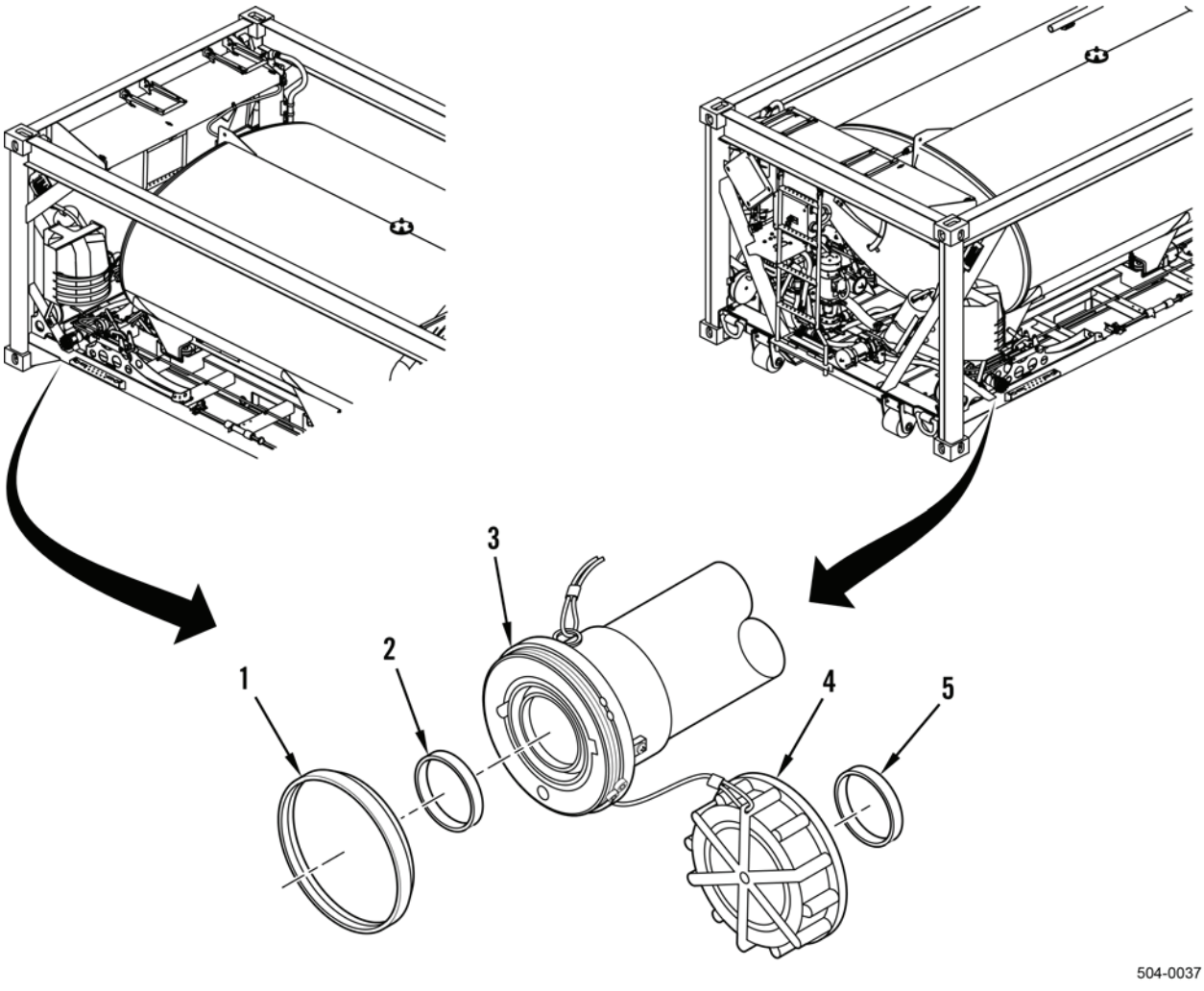


Figure 2. TRM Coupling with Quick-Disconnect Coupling.

REPLACE SEALS IN QUICK-DISCONNECT COUPLINGS - CONTINUED

CAUTION

Use caution when using putty knife to prevent damage to equipment.

6. Clean quick-disconnect coupling half (Figure 3, Item 3) and dust cap (Figure 3, Item 4).
   a. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas using a putty knife.
   b. Clean all parts with a cleaning cloth.
7. Inspect quick-disconnect coupling half (Figure 3, Item 3) and dust cap (Figure 3, Item 4).
   a. Inspect all parts for cracks, corrosion, or broken fittings. If cracks, corrosion, or broken fittings are found, contact Field Maintenance.
   b. Inspect all wire cables for cracks, frays, distortion, and corrosion. If cracks, frays, distortion, or corrosion is found, contact Field Maintenance.
8. Install new seal (Figure 3, Item 5) in dust cap (Figure 3, Item 4).
9. Install new seal (Figure 3, Item 2) on quick-disconnect coupling half (Figure 3, Item 3).
10. Install new bumper (Figure 3, Item 1) on quick-disconnect coupling half (Figure 3, Item 3).
11. Install dust cap (Figure 3, Item 4) on quick-disconnect coupling half (Figure 3, Item 3).

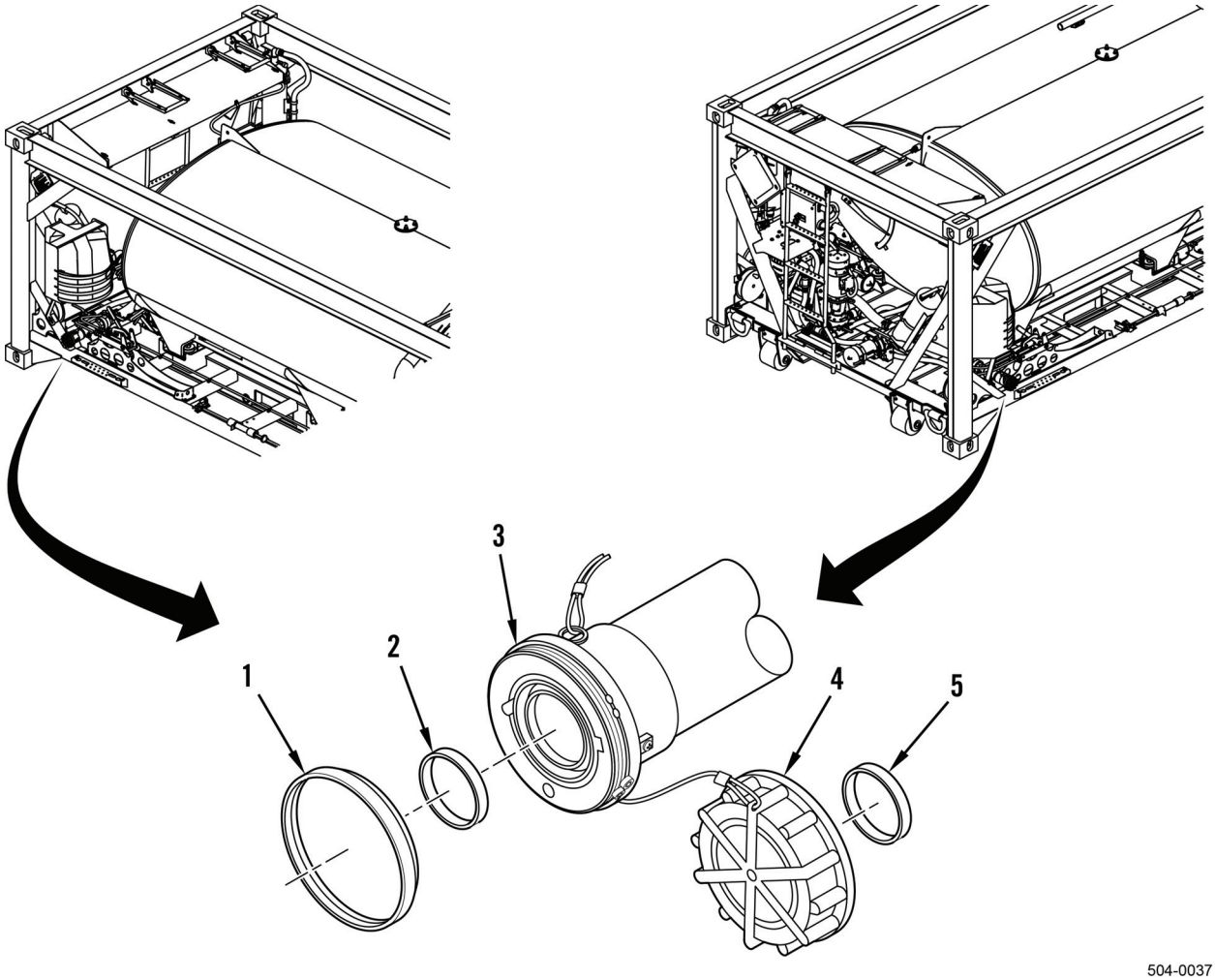


Figure 3. TRM Coupling with Quick-Disconnect Coupling.

REPLACE SEALS IN QUICK-DISCONNECT COUPLINGS - CONTINUED

12. Remove drip pan and dispense of fuel per local SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FUEL PUMP STRAINER REPAIR
Removal, Inspection, Clean, Installation

INITIAL SETUP

Tools and Special Tools

Fire extinguisher (WP 0066, Table 1, Item 1)
Gloves, rubber, industrial (WP 0067, Item 6)
Goggles, industrial (WP 0067, Item 7)
Handle, socket wrench (WP 0066, Table 2, Item 3)
Socket, socket wrench, 9/16 in.,12 pt, 1/2 in. drive, deep well (WP 0066, Table 2, Item 9)
Wrench, 9/16 in., box and open end (WP 0066, Table 2, Item 12)

Materials/Parts

Cloth, cleaning (WP 0067, Item 4)
Corrosion preventive compound (WP 0067, Item 5)
Grease, general purpose (WP 0067, Item 10)

Personnel Required

Two

Equipment Condition

TRM shut down (WP 0027)

WARNING

- Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available.
- Use caution when operating valves and equipment at rear of TRM to avoid striking head on top beam of frame.
- Failure to comply may result in injury or death to personnel.

REMOVAL

1. Place suitable container under fuel strainer assembly to capture any residual fuel.
2. Use a ratchet, 9/16 in. deep well socket, and a 9/16 in. box and open end wrench to remove two bolts (Figure 1, Item 2), two nuts (Figure 1, Item 6), and clamp (Figure 1, Item 1) from fuel pump strainer assembly (Figure 1, Item 3).
3. Remove cap (Figure 1, Item 8) and gasket (Figure 1, Item 7) from fuel pump strainer assembly (Figure 1, Item 3).
4. Remove strainer (Figure 1, Item 5) from fuel pump strainer assembly (Figure 1, Item 3).
5. Remove O-ring (Figure 1, Item 4) from strainer (Figure 1, Item 5).

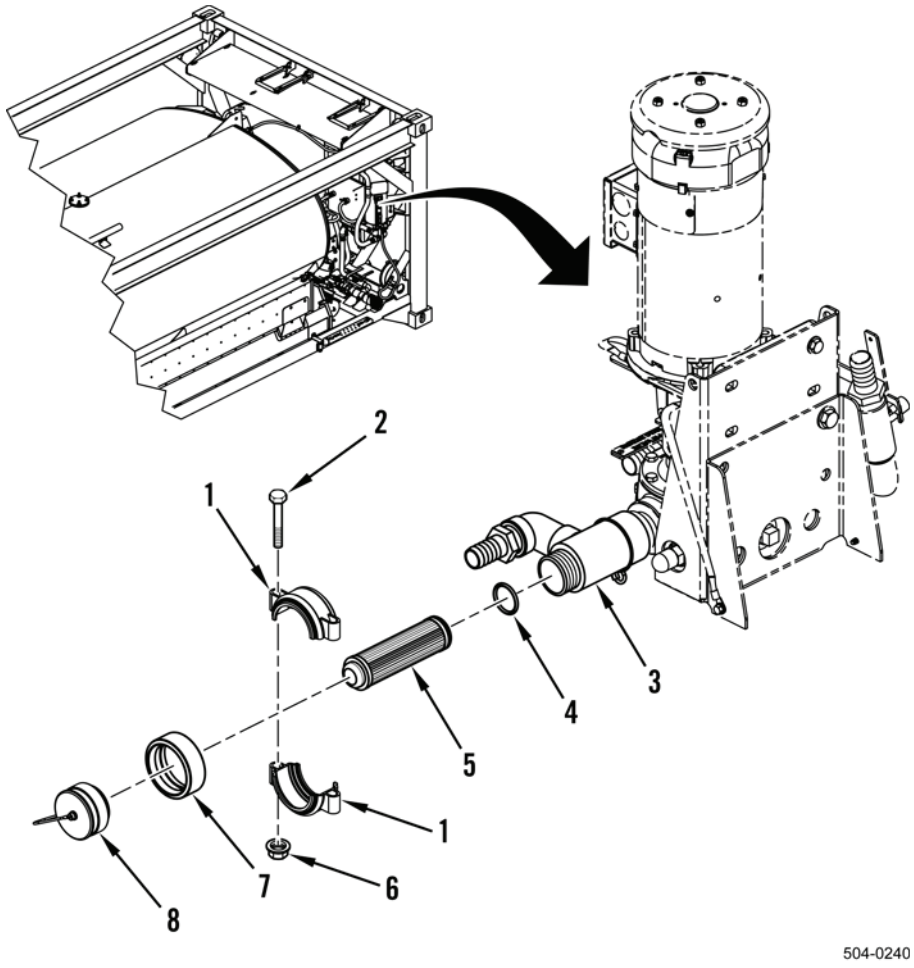


Figure 1. Fuel Pump Strainer.

END OF TASK

INSPECTION

1. Ensure strainer (Figure 1, Item 5) is not damaged or torn.
2. Contact Field Maintenance if strainer (Figure 1, Item 5) is damaged or torn.
3. Ensure strainer (Figure 1, Item 5) is free of dirt or debris. Clean strainer per cleaning task in this work package.
4. Ensure O-ring (Figure 1, Item 4) is not damaged or torn.
5. Contact Field Maintenance if O-ring (Figure 1, Item 4) is damaged or torn.

END OF TASK

CLEAN

1. Tap strainer (Figure 1, Item 5) gently on a hard surface to remove dirt or debris.
2. Brush strainer (Figure 1, Item 5) with a soft cleaning cloth to remove dirt or debris.
3. Rinse strainer (Figure 1, Item 5) in clean fuel until free of dirt or debris.
4. Dispose of cleaning cloth and fuel per local SOP.

END OF TASK

INSTALLATION

1. Lubricate O-ring (Figure 1, Item 4) lightly with grease.
2. Install O-ring (Figure 1, Item 4) on strainer (Figure 1, Item 5).
3. Install strainer (Figure 1, Item 5) in fuel pump strainer assembly (Figure 1, Item 3).
4. Install cap (Figure 1, Item 8) and gasket (Figure 1, Item 7) on fuel pump strainer assembly (Figure 1, Item 3).

WARNING

Corrosion preventive compound is toxic and an irritant to eyes, skin, and respiratory system. Goggles and gloves must be worn when working with corrosion preventive compound. Avoid contact with eyes and skin. Avoid breathing vapors and ensure there is adequate ventilation. If sealing compound contacts eyes, flush eyes with cold water for at least 15 minutes and seek immediate medical attention. If sealing compound contacts skin, wash skin thoroughly with soap and water. Failure to comply could result in injury or death to personnel.

NOTE

Bolts must be tightened equally to prevent leaks.

5. Apply a thin coat of corrosion preventive compound to threads of two bolts (Figure 1, Item 2), and two nuts (Figure 1, Item 6) and install clamp (Figure 1, Item 1) on fuel pump strainer assembly (Figure 1, Item 3).
6. Use a ratchet, 9/16 in. deep well socket, and 9/16 in. box and open end wrench to tighten two bolts (Figure 1, Item 2).
7. Remove container and dispose of contents per local SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PREPARATION FOR STORAGE OR SHIPMENT

Overview, Specifications and Standards, Marking, Preparation for Storage, Short-Term Storage, Long-Term Storage, Preparation for Shipment, Depreservation

INITIAL SETUP

Materials/Parts

- Barrier material (WP 0067, Item 2)
- Fire extinguisher (WP 0066, Table 1, Item 1)
- Gloves, rubber, industrial (WP 0067, Item 6)
- Goggles, industrial (WP 0067, Item 7)
- Grease, automotive and artillery (WP 0067, Item 9)
- Grease, white lithium (WP 0067, Item 8)
- Oil, lubricating, general purpose (WP 0067, Item 11)
- Stabilizer additive, diesel fuel (WP 0067, Item 13)
- Tape, pressure sensitive adhesive (WP 0067, Item 14)
- Tape, pressure sensitive adhesive (WP 0067, Item 15)

References

- MIL-STD-129
- MIL-STD-130
- MIL-STD-2073-1
- WP 0002
- WP 0004
- WP 0021
- WP 0031
- WP 0060
- WP 0061
- WP 0066

Personnel Required

- Two

Equipment Condition

- TRM shut down (WP 0027)
- TRM prepared for movement (WP 0026)

OVERVIEW

The TRM provides limited space for the storage of accessory components. Accessory components such as suction hoses, discharge hoses, and nozzles are stowed in enclosures mounted on the TRM. The tee assembly, ground rod, manhole transporter cover, fire extinguishers, and camlock adapter are stowed on the exterior of the TRM (WP 0002).

The TRM components can be stored for periods of both short term and long term. Short-term storage is defined as less than 180 days. Long-term storage is defined as longer than 180 days, and less than two years. The TRM should always be grounded while in storage. PMCS should be performed when a TRM is removed from storage and prior to shipment (WP 0060).

The TRM is capable of shipment by land, marine, and specified air modes of transportation. Preparation for shipment of the TRM is for both extended storage, after operation, and to ensure transportability requirements of the selected mode are met. The primary purpose of the preparation procedures is to ensure the tank and piping are properly evacuated, all power sources are inoperative and all components are properly secured for protection from shipment stress loads and damage. An exception to this process is when the TRM is to be deployed via Low Velocity Air Drop (LVAD), in which the TRM must be capable of being deployed with a full (or empty) tank; special procedures developed for LVAD are applicable in these instances.

SPECIFICATIONS AND STANDARDS

Packaging techniques in this work package are based on MIL-STD-2073-1 and procedures commonly used to meet Level-A packaging. OEM packaging and industry standard packs for worldwide shipment are permitted when they meet or exceed this requirement. MIL-STD-129 is used to determine requisite marking, supplemented by MIL-STD-130.

MARKING

TRM materiel packed for shipment and storage shall be marked per MIL-STD-129 and MIL-STD-130.

PREPARATION FOR STORAGE

Preservation and packing is the first step in preparing materiel or equipment for storage. It is intended to protect the materiel or equipment against the adverse effects of direct exposure to extremes of rough terrain, climate, deterioration, corrosion, dents, cracks, rotting, and fungus. For all TRM materiel or equipment, preservation and packaging is a process of weatherproofing and assembling items into a unit which can be shelf mounted or binned. Larger items must be skid or pallet mounted with subordinate materiel or equipment in wooden boxes or trays. All items must have necessary identification. Refer to MIL-STD-129 and MIL-STD-130.

Preservative materials used for the TRM are primarily oils and lubricants. Desiccants and item holders (waxed paper and plastics) are also used. Materials used for packing include, but are not limited to, adhesives, boxes, sacks, envelopes, barrier paper, cushioning material, and wrapping materials. Refer to MIL-STD-2073-1 for detailed preservation procedures.

Items must be packed to a Level-A standard, the military designation for the level of preservation and packing required for the protection of materiel or equipment against the most severe worldwide shipment, handling and storage conditions.

SHORT-TERM STORAGE

Use the steps that follow to prepare the TRM for short-term storage.

WARNING

Goggles and gloves must be worn while using petroleum-based products. Avoid contact with eyes and skin. Failure to comply could result in injury to personnel.

1. Lubricate all moving parts of door-locking mechanism, door hinges, document holder hinges and hasps of shipping and storage containers with automotive and artillery grease or white lithium (lubricating) grease.

SHORT-TERM STORAGE - CONTINUED

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

- Refer to Location and Description of Major Components (WP 0002) for location of TRM components.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

2. Drain TRM tank through Port A or Port B (WP 0021).
3. Fill TRM tank with 100 gal (379 L) of fuel and add 4.0 oz (0.1183 L) diesel fuel stabilizer additive.
4. Circulate additive-treated fuel so that all plumbing lines and retail components are completely filled.
5. Drain and dispose of fuel per local SOP.
6. Close tank drains.
7. Wrap side ports D and E, top load port F, and side load port A with protective barrier material and secure with adhesive tape.
8. Ensure all caps and plugs are installed on quick-disconnect end fittings of suction hoses.
9. Place suction hoses in designated storage tubes mounted on side of TRM (WP 0031).
10. Ensure all caps and plugs are installed on quick-disconnect end fittings of discharge hoses.
11. Place discharge hoses in cabinet at rear of TRM and securely fasten (WP 0031).
12. Open butterfly valves (V5, V7, V13) and ball valve (V6). Lightly coat operating mechanism with general purpose oil.
13. Close butterfly valves (V5, V7, V13) and ball valve (V6). Lightly coat any surface that was not accessible in the open position with general purpose oil.
14. Check for presence and condition of all Components of End Item (COEI)/Basic Issue Items (BII) (WP 0031).
15. Coil ground cable and securely fasten to open port nozzle assembly with grounding clamp and connector.
16. Place open port nozzle assembly in tool box located at right front of TRM and securely fasten (WP 0031).
17. Install dust caps on flange adapter assembly fittings.
18. Place flange adapter assembly in tool box located at right front of TRM and securely fasten (WP 0031).
19. Place quick-disconnect reducer in tool box located at right front of TRM and securely fasten (WP 0031).
20. Install dust caps on male and female NATO connectors.
21. Place male and female NATO connectors in tool box located at right front of TRM and securely fasten (WP 0031).
22. Wrap the two fire extinguisher gauges and discharge nozzle ends with protective barrier material and secure with adhesive tape.

SHORT-TERM STORAGE - CONTINUED

23. Securely fasten ground rod to ground rod bracket.
24. Drain fuel and water from filter/separator (WP 0061).
25. Contact Field Maintenance to drain fuel from fuel pump assembly and flow meter.

END OF TASK

LONG-TERM STORAGE

Use the steps that follow to prepare the TRM for long-term storage.

WARNING

Goggles and gloves must be worn while using petroleum-based products. Avoid contact with eyes and skin. Failure to comply could result in injury to personnel.

1. Lubricate all moving parts of door-locking mechanism, door hinges, document holder hinges and hasps of shipping and storage containers with automotive and artillery grease or white lithium (lubricating) grease.

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

- Refer to Location and Description of Major Components (WP 0002) for location of components on the TRM.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

2. Drain TRM tank through Port A or Port B (WP 0021).
3. Fill TRM tank with 100 gal (379 L) of fuel and add 4.0 oz (0.1183 L) diesel fuel stabilizer additive.
4. Circulate additive-treated fuel so that all plumbing lines and retail components are completely filled.
5. Drain and dispose of fuel per local SOP.
6. Close tank drains.
7. Wrap side ports D and E, top load port F, and side load port A with protective barrier material and secure with adhesive tape.
8. Ensure all caps and plugs are installed on quick-disconnect end fittings of suction hoses.
9. Place suction hoses in designated storage tubes mounted on side of TRM (WP 0031).
10. Ensure all caps and plugs are installed on quick-disconnect end fittings of discharge hoses.

LONG-TERM STORAGE - CONTINUED

11. Place discharge hoses in cabinet at rear of TRM and securely fasten (WP 0031).
12. Open butterfly valves (V5, V7, V13) and ball valve (V6). Lightly coat operating mechanism with general purpose oil.
13. Close butterfly valves (V5, V7, V13) and ball valve (V6). Lightly coat any surface that was not accessible in the open position with general purpose oil.
14. Check for presence and condition of all Components of End Item (COEI)/Basic Issue Items (BII) (WP 0031).
15. Coil ground cable and securely fasten to open port nozzle assembly with grounding clamp and connector.
16. Place open port nozzle assembly in tool box located at right front of TRM and securely fasten (WP 0031).
17. Install dust caps on flange adapter assembly fittings.
18. Place flange adapter assembly in tool box located at right front of TRM and securely fasten (WP 0031).
19. Place quick-disconnect reducer in tool box located at right front of TRM and securely fasten (WP 0031).
20. Install dust caps on male and female NATO connectors.
21. Place male and female NATO connectors in tool box located at right front of TRM and securely fasten (WP 0031).
22. Wrap the two fire extinguisher gauges and discharge nozzle ends with protective barrier material and secure with adhesive tape.
23. Securely fasten ground rod to ground rod bracket.
24. Ensure all fuel has been drained from filter/separator (WP 0061).
25. Contact Field Maintenance to remove filter elements that have been wetted and discard per local SOP.
26. Wrap flow meter display with protective barrier material and secure with adhesive tape.
27. Contact Field Maintenance to drain fuel from fuel pump assembly and flow meter.

END OF TASK

PREPARATION FOR SHIPMENT

Use the steps that follow to prepare the TRM for shipment.

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Use cotton waste for cleaning purposes; other material may generate static electricity and cause fuel to ignite. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

NOTE

- Refer to Location and Description of Major Components (WP 0002) for location of TRM components.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports, valves, and connection points.

1. Drain fuel from all hoses from low point drains or from inlet and discharge connections into approved containers.
2. Close or install all low point drain plugs and caps and plugs on inlet and discharge connections.
3. Pump down and drain all residual fuel from all discharge connections on TRM.
4. Contact Field Maintenance to open low point valve on main discharge hose and remove residual fuel with fuel pump assembly into approved container.
5. Apply barrier material to all inlet and discharge connections and seal with tape.
6. Place tee connection, ground rods and retail hose and retail servicing nozzle in designated storage locations on TRM and secure with tiedowns.
7. Check mounting latches on fire extinguishers for tightness.
8. Install dust caps and plugs on discharge hoses and place in storage tubes located on base of TRM rack.
9. Close tube covers and ensure latches are securely fastened.
10. Evacuate all hoses, nozzles, valves and fittings of residual fuel.
11. After evacuation of fuel, allow nozzles, valves, fittings and tees to air dry.
12. Install dust caps and plugs on all hoses.
13. Secure all components in designated storage locations of TRM with tiedowns or other restraints.
14. Purge TRM by chemical means (WP 0026) if required for air transport or repair.

END OF TASK

DEPRESERVATION

Use the steps that follow to remove the TRM from short-term or long-term storage.

WARNING

Damage to components can occur during shipment or storage. Inspect all components for damage before the system is installed and operated. Failure to comply could result in serious injury or death to personnel or damage to equipment.

NOTE

- Refer to Location and Description of Major Components (WP 0002) for location of TRM components.
- Refer to TRM Controls and Indicators (WP 0004) for location of ports and valves.

1. Unpack and inventory all system components (WP 0066).
2. Remove ground rod from ground rod bracket.
3. Remove protective barrier material from ground rod, if applicable.
4. Remove protective barrier material from fire extinguishers.
5. Remove fire extinguishers from stowage racks on TRM and inspect for broken or missing seals and any obvious damage that may render fire extinguisher unserviceable.
6. Remove all caps and plugs from quick-disconnect cam-locking fittings on nozzle assemblies.
7. Remove dust cap from the nozzle opening and inspect dust cap and seals for damage.
8. Install dust cap on nozzle until ready to use nozzle.
9. Remove grounding clip and grounding plug connector from ground cable and uncoil.
10. Inspect nozzle body, ground cable, grounding clip and grounding plug connector for any visible damage, fraying or corrosion that may have occurred during shipment or storage.
11. Remove caps and plugs from the quick-disconnect fittings on tees and adapter and inspect the quick-disconnect fittings and seals for damage and corrosion.
12. Remove all caps and plugs from butterfly valves (V5, V7, V13) and ball valve (V6) and inspect valves for damage that may have occurred during shipment or storage.
13. Remove caps or plugs from the end fittings of discharge hoses and inspect end fittings and seals for damage and corrosion.
14. Inspect all discharge hose assemblies for damaged couplings, wear, cuts, tears or deterioration that may have occurred during shipment or storage.
15. Remove all caps and plugs from the end fittings on suction hoses and inspect end fittings and seals for damaged and corrosion.
16. Inspect all suction hose assemblies for damaged couplings, wear, cuts, tears or deterioration that may have occurred during shipment or storage.
17. Inspect any shipping and storage containers for damage, wear, or deterioration that may have occurred during shipment or storage.
18. Remove fuel spill control kit components from storage and inspect all components for damage, wear, or deterioration that may have occurred during shipment or storage.

DEPRESERVATION - CONTINUED

19. Remove any cushioning material and tape from flow meter display and inspect flow meter and display for damage and corrosion.
20. Remove any cushioning material and tape from filter/separator and inspect gauges and filter/separator for damage and corrosion.
21. Remove protective barrier material and tape from side ports D and E, top load port F, and side load port A and inspect ports for damage and corrosion.
22. Contact Field Maintenance to install a new filter in the filter/separator if removed for long-term storage.
23. Perform (BEFORE) PMCS (WP 0060).

END OF TASK

END OF WORK PACKAGE

CHAPTER 5

SUPPORTING INFORMATION

OPERATOR MAINTENANCE

REFERENCES

Scope, Army Regulations, Army Technical Publications, DA Pamphlets, Field Manuals, Forms, Military Standards, Miscellaneous, Technical Manuals

SCOPE

This work package lists the publications referenced in this manual.

ARMY REGULATIONS

AR 200-1	Environmental Protection and Enhancement

ARMY TECHNICAL PUBLICATIONS

ATP 4-43	Petroleum Supply Operations

DA PAMPHLETS

DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

FIELD MANUALS

FM 3-11.4	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological and Chemical (NBC) Protection
FM 3-11.5	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination
FM 4-25.11	First Aid
FM 10-67-1	Concepts and Equipment of Petroleum Operations

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988-E	Equipment Maintenance and Inspection Worksheet (Automated)
SF 368	Product Quality Deficiency Report

MILITARY STANDARDS

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-3004D	Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products
MIL-STD-2073-1	Standard Practice for Military Packaging

MISCELLANEOUS

ATTP 3-97.11	Cold Region Operations
CTA 8-100	Common Table of Allowances, Army Medical Department Expendable/Durable Items
CTA 50-970	Common Table of Allowances, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items)
CTA 50-909	Common Table of Allowances, Field and Garrison Furnishings and Equipment

TECHNICAL MANUALS

TM 4-33.31	Operation and Maintenance of Ordnance Materiel in Cold Weather
TM 9-2320-319-10-1	Operator's Manual for Truck Tractor, M1074A1 and M1075A1 Palletized Load System (PLS)
TM 9-2320-319-10-2	Operator's Manual for Truck Tractor, M1074A1 and M1075A1 PLS
TM 9-2320-325-14&P	Operator's Manual with Maintenance Repair Parts and Special Tools List for Heavy Expanded Mobility Tactical Truck (HEMTT A2)
TM 9-2320-339-10	Operator's Manual for Truck, Tank, 8 x 8 M978A4 w/winch M978A4 w/o winch
TM 9-2320-345-10	Operator's Manual for Truck, Load Handling System (LHS), w/ and w/o Winch, 8 x 8, M1120A4
TM 9-2320-348-10	Operator's Manual for Truck, Tank, 8 x 8 M978A2 w/winch M978A2 w/o winch
TM 9-2320-364-10	Operator's Manual for Truck, Tractor, M1074 and M1075 PLS
TM 9-2320-424-10	Operator's Manual for Truck, LHS, w/ and w/out Winch, 8 x 8 M1120A2
TM 9-2320-429-10	Operator's Manual for Truck, Tank, 8 x 8 M978
TM 9-2330-342-10	Operator's Manual for Palletized Load System Trailer (PLST) M1076A1
TM 9-2330-385-10	Operator's Manual for PLST M1076
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

END OF WORK PACKAGE

OPERATOR MAINTENANCE

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS
Scope, General, Explanation of Columns, COEI and BII Lists

SCOPE

This work package lists COEI and BII for the Tank Rack Module (TRM) to help you inventory items for safe and efficient operation of the equipment.

GENERAL

The COEI and BII information is divided into the following lists:

1. **COEI.** This list is for information purposes only and is not authority to requisition replacements. These Items are part of the TRM. As part of the end Item, these Items must be with the end Item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the Items.
2. **BII.** These essential Items are required to place the TRM in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the TRM during operation and when it is transferred between property accounts. Listing these Items is your authority to request/requisition them for replacement based on authorization of the end Item by the Table of Organization and Equipment/Modified Table of Organization and Equipment (TOE/MTOE). Illustrations are furnished to help you find and identify the Items.

EXPLANATION OF COLUMNS

1. **Column (1) Illus Number.** Gives you the number of the Item illustrated.
2. **Column (2) National Stock Number.** Identifies the stock number of the Item to be used for requisitioning purposes.
3. **Column (3) Description, Part Number/(CAGEC).** Identifies the Federal Item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).
4. **Column (4) Usable On Code.** When applicable, gives you a code if the Item you need is not the same for different models of equipment.
5. **Column (5) U/I.** Unit of Issue (U/I) indicates the physical measurement or count of the Item as issued per the National Stock Number shown in column (2).
6. **Column (6) Qty Rqr.** Indicates the quantity required.

COEI LIST

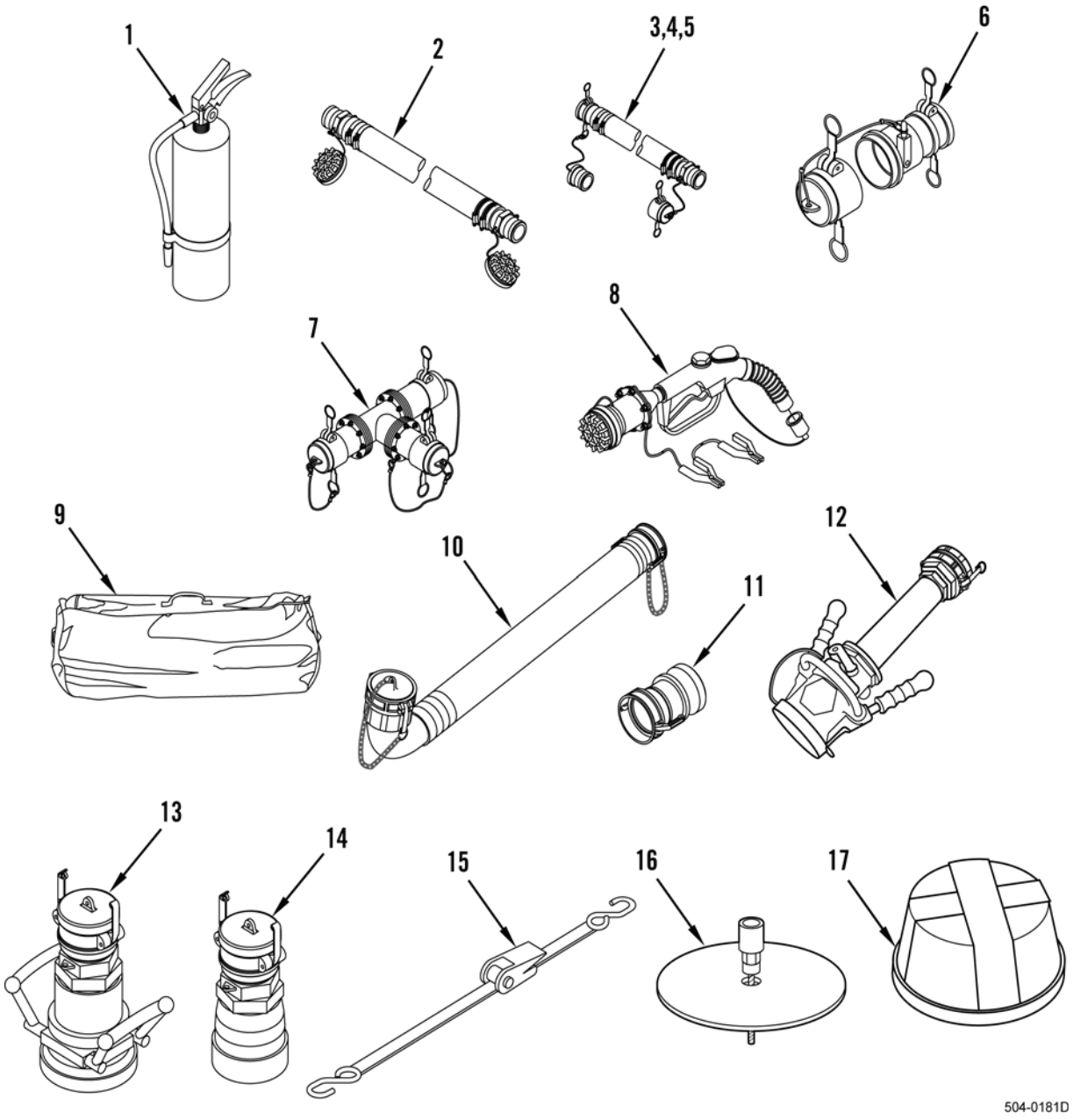


Table 1. COEI Items

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
1	4210-01-608-3387	Fire extinguisher dry chemical (hand portable) 429011 (03670)		EA	2
2	4720-01-582-7881	Hose, discharge, 2 in. x 13 ft (5.08 cm x 3.96 m) 5251747 (80195)		EA	2
3	4720-01-582-7865	Hose, discharge, 4 in. x 15 ft (10.16 cm x 4.6 m) 6001538 (80195)		EA	2

COEI LIST - CONTINUED

Table 1. COEI Items - Continued.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
4	4720-01-582-8153	Hose, discharge, 4 in. x 8 ft (10.16 cm x 2.4 m) 6001882 (80195)		EA	1
5	4720-01-582-8171	Hose, discharge, 4 in. x 6 ft (10.16 cm x 1.83 m) 6001903 (80195)		EA	1
6	4730-01-582-7846	Camlock adapter 5251391 (80195)		EA	1
7	4930-01-582-7894	Tee assembly 5251206 (80195)		EA	1
8	4930-01-582-7514	Nozzle assembly (open port) 300ALMM 200 ANAJ (41592)		EA	1
9	4235-01-582-7903	Kit, fuel spill control KIT423 (1JA49)		EA	1
10	4720-01-582-7975	Hose, discharge, 3 in. x 3.5 ft (7.6 cm x 1.1 m) 6001908 (80195)		EA	1
11	4730-00-951-3296	Reducer, quick-disconnect, 3 to 4 in. (7.62 cm to 10.16 cm) AA59326/12-5-A-2 (58536)		EA	1
12		Flange adapter assembly (D1) consisting of:			
	4730-01-582-7910	Adapter flange assembly 5251624 (80195)		EA	1
	4930-01-483-8060	Nozzle, fuel and oil servicing 2017047J (86184)		EA	1
	5331-00-935-9226	O-ring MS29513-151 (81343)		EA	1
	5305-01-451-9220	Screw, cap, hexagon head 92865A542 (39428)		EA	6
	5310-01-531-6758	Washer, flat 90108A413 (39428)		EA	6
	5310-01-083-0799	Washer, lock 0120380 (80195)		EA	6
13		Parts kit, quick-disconnect coupling assembly (NATO adapter assembly, female) 5252420 (80195)		EA	1
14		Parts kit, quick-disconnect coupling assembly (NATO adapter assembly, male) 5252421 (80195)		EA	1
15		Strap, retaining, for spill kit 6001899 (80195)		EA	2
16	2040-01-5827-522	Transporter cover 5251389 (80195)		EA	1
17	4940-01-504-5273	Pan, drip, 6.5 gal. capacity PB6C-10 (4N5U7)		EA	4

COEI LIST – CONTINUED

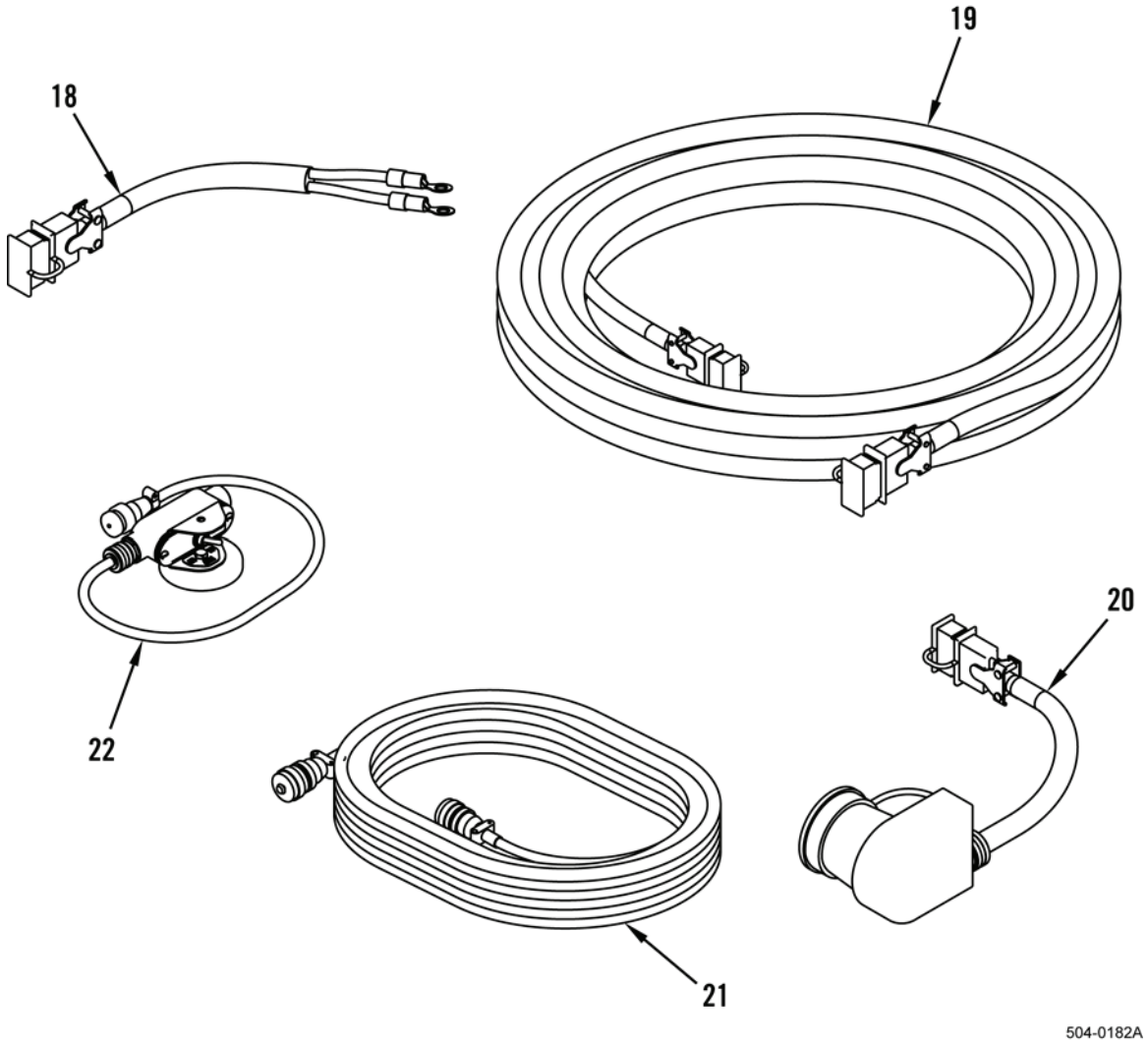


Table 1. COEI Items - Continued.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
18		Cable assembly, genset 5252506 (80195)		EA	1
19		Cable assembly, slave, 40 ft 5252504 (80195)		EA	1
20		Cable assembly, NATO 5252505 (80195)		EA	1
21		Cable assembly, pump control 5252546 (80195)		EA	1
22		Switch box assembly 5252563 (80195)		EA	1

COEI LIST – CONTINUED

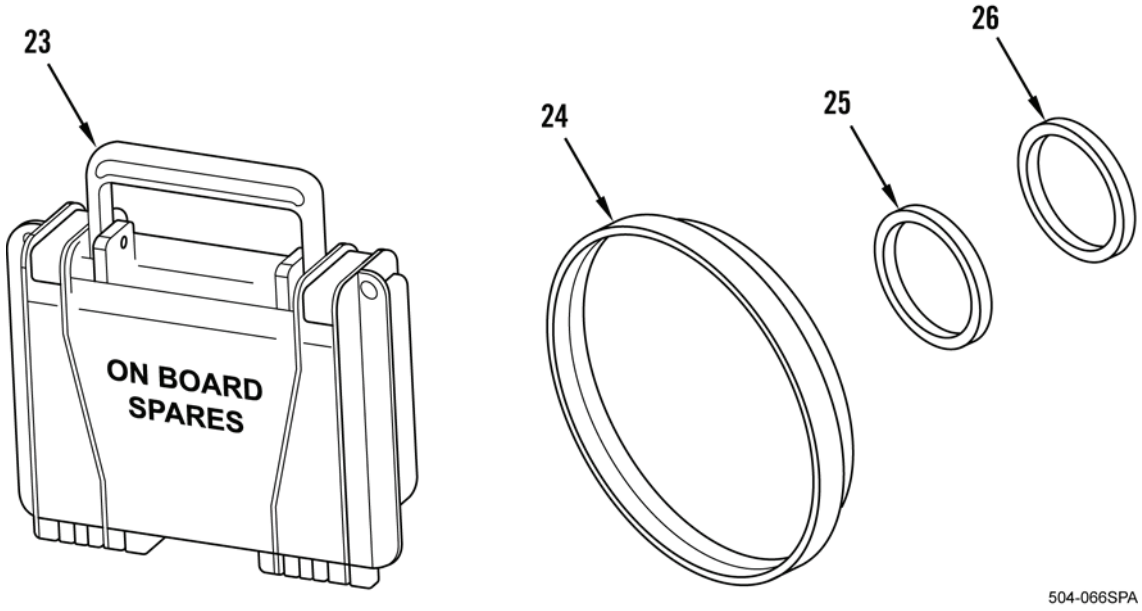


Table 1. COEI Items - Continued.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
23		Box, polymer, watertight, airtight, dust proof SE120 (42RA1)		EA	1
		ON BOARD SPARES (Inside item 23)			
24	2510-01-641-3811	Cap, bumper RJ0001 (61125)		EA	4
25	5330-01-641-3634	Seal, plain RJ0009 (61125)		EA	8
26	5330-00-899-4509	Gasket AA59326-G-9 (58536)		EA	2

BII LIST

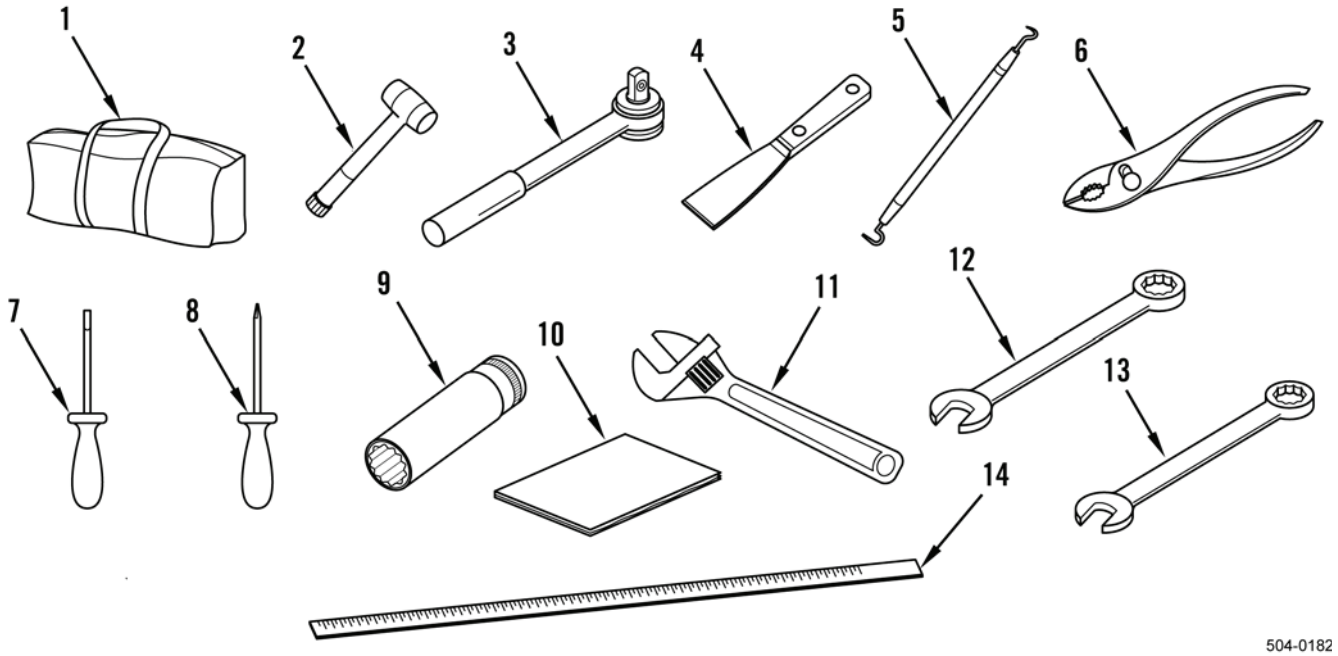


Table 2 . BII Items.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
1	5140-00-473-6256	Bag, tool 5140-00-473-6256 (64067)		EA	1
2	5120-01-065-9037	Hammer, hand soft plastic head 57-533 (1CV05)		EA	1
3	5120-01-601-5184	Handle, socket wrench 1/2 in. drive 12-992 (636D0)		EA	1
4	5120-00-221-1536	Knife, putty 1-1/4 in. blade 5120-00-221-1536 (80244)		EA	1
5	5120-01-368-5828	Pick, miniature (seal) 2554 (636D0)		EA	1
6	5120-00-223-7397	Pliers, slip joint 8 in. 66-018 (52346)		PR	1
7	5120-00-222-8852	Screwdriver, flat tip 1/4 in. 00941583000 (53800)		EA	1

BII LIST - CONTINUED

Table 2. BII Items - Continued.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, PART NUMBER/(CAGEC)	(4) USABLE ON CODE	(5) U/I	(6) QTY RQR
8	5120-00-234-8913	Screwdriver, cross tip #2 11655777-12 (19207)		EA	1
9	5120-01-579-1028	Socket, socket wrench 9/16 in.,12 pt, 1/2 in. drive, deep well 12-318 (636D0)		EA	1
10		Technical manual, TM 10-4930-370-10		EA	1
11	5120-00-264-3796	Wrench, 12 in., adjustable 11655778-5 (19207)		EA	1
12	5120-01-429-7388	Wrench, 9/16 in., box and open end SOEX18 (55719)		EA	1
13	5120-01-429-7383	Wrench, 1/2 in., box and open end SOEX16 (55719)		EA	1
14	6680-01-582-7535	Gauge stick 5252235 (80195)		EA	1

END OF WORK PACKAGE

OPERATOR MAINTENANCE

EXPENDABLE AND DURABLE ITEMS LIST
Scope, Explanation of Columns in Expendable/Durable Items List (EDIL)

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the MFS TRM with Stand-Alone Retail Capability (MFS TRM S-ARC). This list is for information only and is not authority to requisition the listed Items. These Items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items.

EXPLANATION OF COLUMNS IN EXPENDABLE/DURABLE ITEMS LIST (EDIL)

1. **Column (1) Item No.** This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the Item (e.g., Grease, general purpose (WP 0067, Item 10)).
2. **Column (2) Level.** This column identifies the lowest level of maintenance that requires the listed Item (C = Crew, F = Maintainer).
3. **Column (3) National Stock Number (NSN).** This is the NSN assigned to the Item which you can use to requisition it.
4. **Column (4) Item Name, Description, Part Number/(CAGEC).** This column provides the other information you need to identify the Item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).
5. **Column (5) U/I.** Unit of Issue (U/I) code shows the physical measurement or count of an Item, such as gallon, dozen, gross, etc.

Table 3. Expendable and Durable Items List.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER (CAGEC)	(5) U/I
1	C	8415-00-634-5023	Apron, utility 021-758 (15481)	EA
2	C	8135-01-499-5302	Barrier material grease proof, water vapor proof, flexible foil, heavy duty, smooth Class S1 MIL-PRF-131CL1 (80244) 600 ft long, 6 ft wide	RO
3	C	7930-01-350-7034	Cleaning compound, solvent-detergent 185024 (56883)	CN
4	C	7920-00-044-9281	Cloth, cleaning 3479 (0MBA9)	BX
5	C	8030-00-118-0666	Corrosion preventive compound LPS3 (Z0CQ1) 11 oz can	CN

Table 3. Expendable and Durable Items List - Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER (CAGEC)	(5) U/I
6	C	8415-00-266-8675	Gloves, rubber, industrial MIL-DTL-32066 (81349)	PR
7	C	4240-00-203-3804	Goggles, industrial ANSI Z87.1 (80204)	PR
8	C	9150-01-630-2155	Grease, white lithium grade #2, NLGI 300028 (09137)	CN
9	C	9150-01-197-7689	Grease, automotive and artillery MIL-PRF-10924-D (81349)	CN
10	C	9150-01-426-3844	Grease, general purpose MG-75 (60111) 0.75 oz tube	TU
11	C	9150-00-231-6689	Oil, lubricating, general purpose ARPOLUBE 32033 (Z2A69) 1 quart can	QT
12	C	4240-01-269-4169	Respirator, air filtering 313000 (39SU9)	EA
13	C	6850-01-246-6544	Stabilizer additive, diesel fuel MIL-S-53021 (81349) 1 gallon	CN
14	C	7510-00-117-5520	Tape, pressure sensitive adhesive black, type 2, moisture, heat and oil resistant 4812 2 INCHES BLK (52152) 36 yds long, 2 in. wide, 0.0090 in. thick	EA
15	C	7510-00-117-5520	Tape, pressure sensitive adhesive clear, type 3 class 2, water resistant ASTM D5486/D5486M (81346) 60 yds long, 0.5 in. wide	RO

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE *Date you filled out this form.*
TO *(Forward to proponent of publication or form) (Include ZIP Code)* U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IMP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	**FROM** *(Activity and location) (Include ZIP Code)* *Your mailing address*	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM Number	*Date of the TM*	*Title of the TM*

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
	0007-3					*Figure 2, Item 9 should show a lockwasher. Currently shows a flat washer.*
	0018-2					*Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be change to (12).*

SAMPLE

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IMP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	*Your Address*	*Date you filled out this form*

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM Number	*Date of the TM*	*Title of the TM*

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

SAMPLE

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	**DATE**
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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4930-370-10	16 September 2015	Operator Manual for Modular Fuel System Tank Rack Module with Stand-Alone Retail Capability

ITEM NO	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IMP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000		

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4930-370-10	16 September 2015	Operator Manual for Modular Fuel System Tank Rack Module with Stand-Alone Retail Capability

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

APD V4.00

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	**DATE**
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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4930-370-10	16 September 2015	Operator Manual for Modular Fuel System Tank Rack Module with Stand-Alone Retail Capability

ITEM NO	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IMP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000		

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4930-370-10	16 September 2015	Operator Manual for Modular Fuel System Tank Rack Module with Stand-Alone Retail Capability

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

APD V4.00

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	**DATE**
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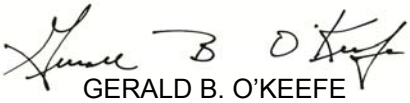
By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:



GERALD B. O'KEEFE
Administrative Assistant to the
Secretary of the Army
1522902

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THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

Weights

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Pounds
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

Liquid Measure

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

Square Measure

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.0386 Sq Miles

Cubic Measure

1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

Temperature

5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 C° +32 = F°

APPROXIMATE CONVERSION FACTORS

To Change	To	Multiply By
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Sq Inches	Sq Centimeters	6.451
Sq Feet	Sq Meters	0.093
Sq Yards	Sq Meters	0.836
Sq Miles	Sq Kilometers	2.590
Acres	Sq Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

To Change	To	Multiply By
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Sq Inches	0.155
Sq Meters	Sq Feet	10.764
Sq Meters	Sq Yards	1.196
Sq Kilometers	Sq Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621